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Keeping Going With the Ordinary Stone and Lime Plant

(Contributed)

THE AVERAGE quarry owner does not possess a "model" or a particularly efficient plant. He is struggling along with what he has, not with what he would like or hopes to have. His problem is to get the most out of his present facilities, both as to plant and markets. How one producer has met this problem is the subject of this "story."

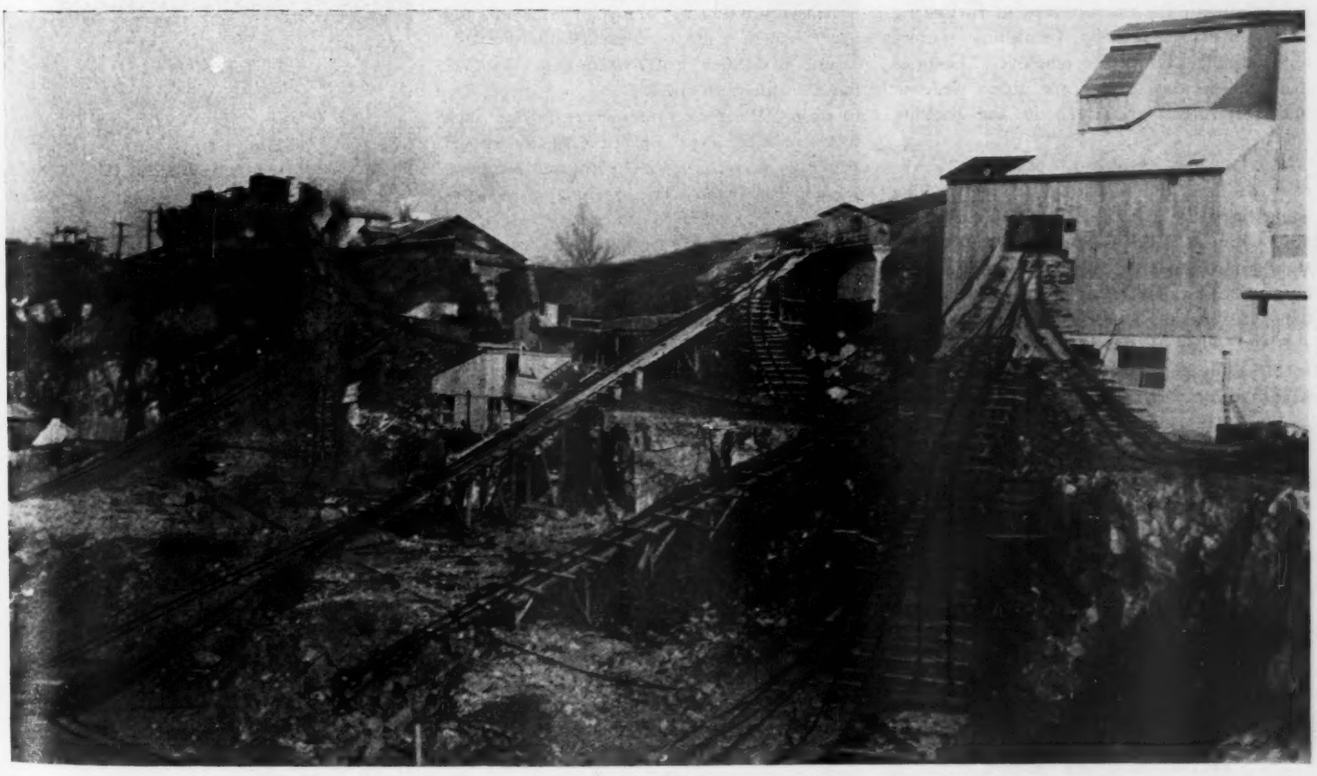
Stephens City is in the heart of the historic Shenandoah Valley of Virginia, well known for the quality of its lime since colonial days. With the history of the region is closely linked the history of the M. J. Grove Lime Co. One Charles Carroll began burning lime at Lime Kiln, Md., as long ago as 1750. The late Manasses J. Grove revived the industry, which had declined somewhat, and founded the present company in 1858. Lime from these kilns had been used in construction of the Capitol in Washington and crushed limestone from its quarries went into the early driveways around the White House. Diversification of products seems to have been among the first policies.

The company has plants at Lime Kiln, Grove and Brookville, Md., as well as at Stephens City, Va. It manufactures concrete building blocks, engages in road building and bridge construction, owns and cultivates five farms, and operates two stores.

Stephens City Operation

Efficiency of the Stephens City unit depends to no small degree upon its well organized personnel. Responsible to the superintendent are two foremen, one of whom takes care of timekeeping. Distribution of the quarrymen is about as follows: Six men commonly are sufficient for stripping although a larger force is sometimes used; 85 are employed in quarrying operations and eleven for tramming.

Eight men operate the ten kilns now active; five men are employed for the hydrator, two for packing and two for loading. Five men are required by the crushed stone department. Shop and mill work is taken care of by a crew of four which includes two carpenters. Among other labor



Property of the M. J. Grove Lime Co., Stephens City, Va. By this arrangement of tracks and inclines, stone is readily trammed from the different quarry floors to kilns (upper left), to the tipple (right center) or to the plant (right) for crushing or pulverizing

Crushing plant of the M. J. Grove Lime Co., Stephens City, Va. Stone comes in at left from quarry, and can be loaded into railway cars with a minimum of handling

is a bricklayer and a truck driver. No electrician is regularly employed although one is available when needed for special work beyond the skill of the full-time workmen.

Overhead, it will be noted, is kept at a minimum. The run of labor is adept and intelligent and consists of natives of the district. One organization policy is that of keeping a man doing his own particular job, changes being avoided whenever possible. The men are better satisfied with this arrangement and supervision is easier for the foremen and the superintendent. Labor turnover is negligible.

Safety work receives considerable attention. Three keymen of the plant organization make weekly inspections and report any dangerous conditions that may have developed or places where further precautions can be taken. Periodic inspections also are made by the insurance company which cooperates with the management in furthering safety consciousness by furnishing posters and making talks to the employes. Goggles are used in the quarry for stone sledging and respirators are worn in the packing shed.

The plant is capable of producing a variety of lime and limestone products. The capacity of the kilns is 220 tons per 24-hour day, while as much as 800 tons of crushed stone and 55 tons of pulverized material can be produced a day. Capacity of the hydrator is 6 tons an hour.

About 40% of the lime sold is in lump form, 10% is pebble, 5% pulverized, and 45% hydrate. Seventy-five per cent of the total is for chemical use, a considerable portion being shipped to water treatment plants, a market that has held up during the depression.

The season's production of unburned material was confined to crushed stone for road work (material 4 in. to dust), pulverized agricultural limestone (90% through 100-mesh, 57% through 200-mesh), and other ground material 10-mesh and finer for the glass trade. The plant, however, is equipped to ship blast-furnace stone, 4 to 12 in. in size, and to supply air-separated pulverized limestone when desired. Hydrated lime is sold for many purposes. An appreciable tonnage of hydrate is sold in bags to dealers for agricultural use.

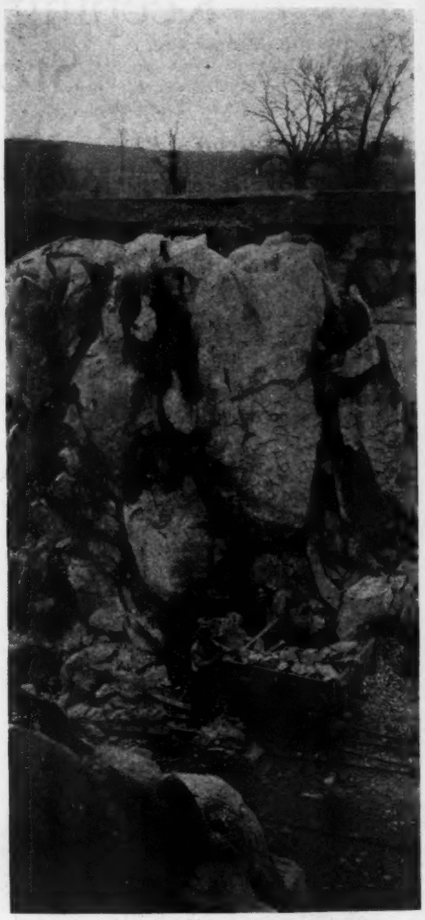
Quarrying

Overburden, though light, is awkward to remove because the rock surface is unevenly eroded and solution channels, caves and sink holes are common. Many of the soil and clay pockets must be attacked individually.

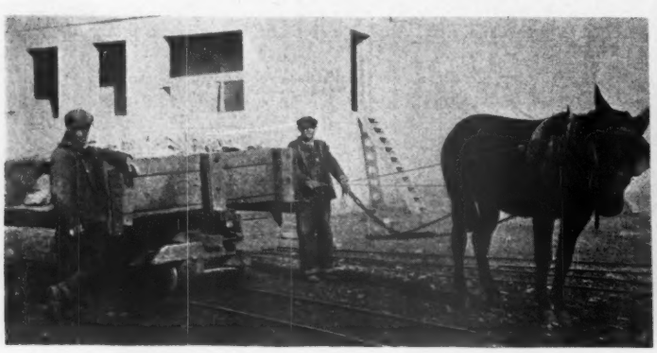
The first step in the stripping is to remove as much of the top soil as is necessary to expose the rock prominences below. Such work may be done with the steam shovel (an Erie ¾-yd. type B), teams and scrapers, or hand methods. The irregular rock surface itself is cleaned chiefly by hand although occasionally a pocket of dirt is encountered which is of sufficient size to accommodate the steam shovel. Hydraulic stripping is contemplated.

An abundance of "elbow room" characterizes the quarry, which is developed to a depth of about 85 ft. By following a scheme whereby four benches are available for mining, full advantage can be taken of beds of different character and purity.

Light drilling is done with Ingersoll-Rand jackhammers and one drifter using ⅞-in. and 1⅛-in. hollow steel. Normal blasting uses 40% gelatine in 1½-in. sticks whereas 20% ⅞-in. sticks are used for blockholes. The steel, sharpened by hand, is tempered for hard or for soft rock. In drilling test holes or holes for larger blasts, a Clipper well drill makes a 6-in. hole to depths of 55 ft. at a cost of about $0.80 per ft.



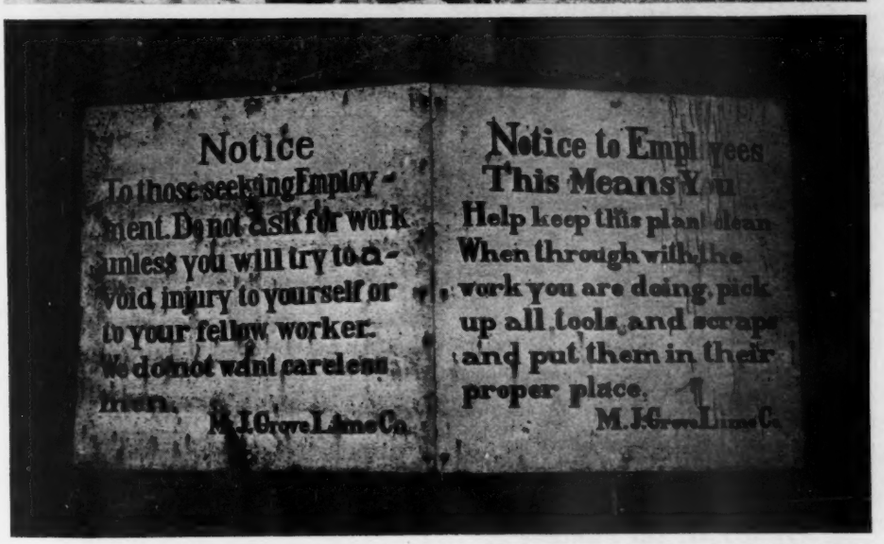
Why stripping is a problem. Careful selection of stone is made at this Virginia plant to insure efficient quarry operation

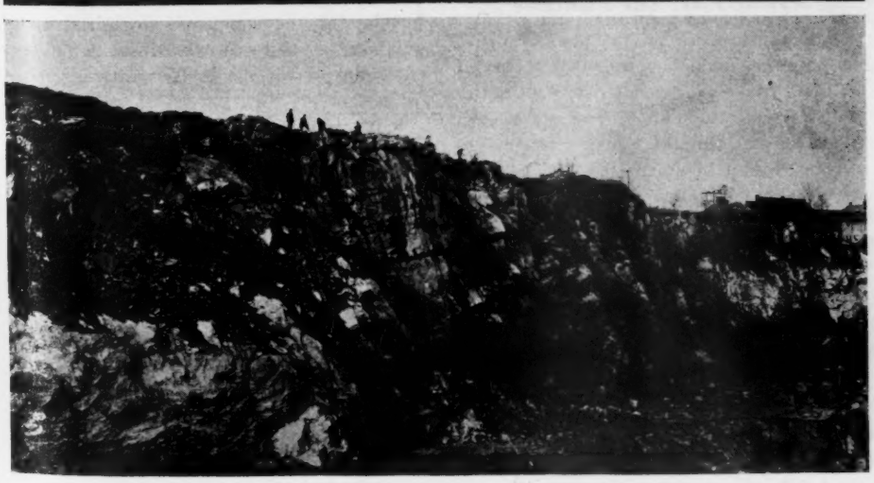


Left: Load of kiln stone ready for the incline cable. The "motive power" figures he has done his part. Right: Stripping in progress south of the main quarry on the M. J. Grove Lime Co. property. Weathered rock surface necessitates much hand work

Loading is done by hand on a piece-work basis. The side-dump wooden cars, made in the shops during spare time, hold about 4,100 lb.

Haulage is accomplished by a "crew" of five mules and two horses. Tramming to the nearby kilns and crushing plant is facilitated by an ingenious network of tracks arranged to handle cars from any part of the quarry to the unit desired. The compactness of the layout is evident from the fact that only 325 ft. of cable is needed from the quarry bottom to the crusher house, and but 675 ft. to the kilns. The wire cable is ½ in. diameter.


Notice
To those seeking Employ-
ment. Do not ask for work
unless you will try to a-
void injury to yourself or
to your fellow worker.
We do not want careless
men.
M. J. Grove Lime Co.
Notice to Employees
This Means You
Help keep this plant clean
When through with the
work you are doing, pick
up all tools and scraps
and put them in their
proper place.
M. J. Grove Lime Co.



Top: Considerable waste must be handled in developing the top quarry floor. Hydraulicking may be tried later. Center: A reminder to old employes and a warning to new men. Below: Getting ready for a blast, men in center on quarry rim are preparing churn drill holes the day before the shot is scheduled

Three ball-bearing reciprocating pumps drain the quarry. They pump against an 85-ft. head and can throw about 700 gal. per min. Pumping is done mainly at night to help equalize the power load. During the day, however, enough water must be pumped to supply the steam shovel and the hydrator.

Lime

Selected stone, 1-man size to about 4-in., is sent to natural draft kilns burning coal from the Fairmont region of West Virginia. There are 20 kilns. Lime is drawn every two hours. From 4 to 4½ tons of lime are burned with one ton of coal; the drawn lime is almost cool enough to hold in the hand.

Lump lime may be crushed in a 20x32-in. crusher and reduced further in a No. 2 K.V. pulverizer. This material may be stored in a 400-ton bin prior to hydration or may be passed over a Universal 2x6-ft. vibrating screen to yield pulverized quicklime, 90% of which will pass a 100-mesh screen.

Hydrated lime is prepared in a Schaffer hydrator. Precise regulation of water and quicklime is maintained by a Schaffer poidometer. Screw conveyors take the hydrated lime to a Raymond mill and air separator, the finished product passing to a sacking bin. The elevators handling the hydrated lime are sealed with felt gaskets to minimize the dust.

Hydrate is packed for shipment by a Bates 4-spout machine in valve paper bags holding 50 lb. Pebble lime is sacked in paper-lined jute bags holding 90 lb. Lime is packed also in wood and steel barrels of 180 or 280-lb. capacity. The wooden barrels are made in the local cooperage shed, but the steel drums are purchased from the Wilkes-Barre Can Co.

Considerable bulk lime is shipped in covered hopper-bottom cars originally developed for transporting bulk cement.

Crushed Stone

Stone unsuitable for lime burning, either because of chemical composition or size, may be shunted to the crushing plant. Primary breaking is done in a No. 6 Allis-Chalmers gyratory crusher. Crushed material is elevated to a 48-in. x 26-ft. rotary screen which can turn out any desired size. Oversize is reduced in a No. 5 Gates gyratory crusher. If desired, material from the rotary screen passes by gravity to a K. B. hammer mill and Buchanan roll crushers from which it is elevated in a steel enclosed elevator to a 3x8-ft. double-deck vibrating screen. Oversize returns to a set of rolls and undersize may pass through a 6-ft. Sturtevant air separator to storage bins. A 2-spout valve-bag sacking machine is available for packing, although much pulverized limestone is shipped in bulk.

Power and Accessories

Plant equipment is well adapted to turning out the desired products, but the operation

has not been burdened with excessive capital expenditures. General plant equipment includes two Ingersoll-Rand air compressors, one 9x8-in. and one 12x14-in, and a Sullivan 8x8-in. compressor Air is delivered under a pressure of 90 lb.

Electric power is furnished by the Northern Virginia Power Co. An interesting feature of the power utilization equipment is a static condenser installed about a year ago. Power efficiency is also gained through installation of ball-bearings on 65% of all motors.

A complete cooperage shop employs ten men and can turn out 100 barrels an hour. Equipment includes one raising machine, one trusser, one closing machine, one hoop riveter, a hoop expander, and a tongue and groove machine. Staves are of local pine, whereas the heading material is Louisiana or Mississippi pine of standard quality.

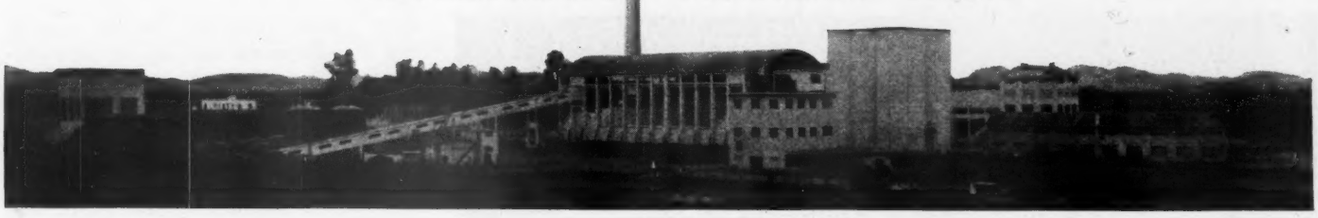
This briefly is the setup of a successful lime and stone operation. Two important phases of the enterprise are worthy of reemphasis because of their bearing to other plants especially at this time. These are, of course, diversification of products and the policy of extending development work well ahead of actual mining, particularly during periods of curtailed business activity.

It is well known that diversification of products tends to stabilize sales to the extent that certain consuming industries, such as building construction and steel, are subject to sharper fluctuations between boom times and depression than are industries supplying relatively nondurable commodities. Also to be borne in mind is the fact that the individual requirements of consumers of lime are sometimes altered because of change in plant practice or through changes purely economic or commercial in character. Ability to anticipate new consumer demands and to utilize raw stone which otherwise might be thrown upon the waste dump may mean the difference between profit and loss.

The purely operating policy of pushing development work during slack seasons needs little amplification for the advantages are readily apparent. Nevertheless, it is here reiterated if for no other reason than to suggest that prosecution of such work at this time will not only yield dividends in the future but will also provide additional jobs now.

In preparing this description of the more important features of the Stephens City plant, the author wishes to acknowledge the courtesy and cooperation of C. A. Cross, superintendent.

Refinement in Design Feature of New Brazilian Cement Plant



A NEW cement factory has recently been completed by the Companhia Nacional de Cimento Portland, a subsidiary of the International Cement Corp., New York City. This plant is located about 25 miles northeast of the City of Rio, across Guanabara Bay.

For many years, International Cement Corp., which has subsidiary plants in Argentine, Uruguay and Cuba, as well as in the United States, has prospected for suitable material for a plant near Rio de Janeiro and in 1930 succeeded in locating a deposit of limestone in the State of Rio de Janeiro, about 15 miles northeast of Nichteroy. After thorough core drilling a very extensive tonnage of good lime rock, analyzing 90 to 95 per cent $CaCO_3$ was blocked out.

This deposit is in rough, hilly country, about 10 km. from the nearest railroad point and 15 km. from the nearest point for water shipments.

In 1931 the company was organized and authorized under the laws of Brazil. Late in the year preparations for the construction of the plant were begun. After careful studies and surveys it was decided to locate the plant near the station Guaxindiba, at Km. 20 from Nichteroy, on the Leopoldina railway. This required the building of about 16 km. of railroad from the quarry to the plant for transportation of lime rock; and by dredging about 1 km. of canal from the plant site to Guaxindiba river, an outlet by water could be provided to Guanabara Bay, making possible water transportation to and from Rio de Janeiro and all points on the bay. A spur from the Leopoldina railway into the plant gives facilities for rail shipments to all points on the Leopoldina system, and by transfer in Rio de Janeiro, to all the rail lines going out from there.

Making Plant Site Habitable

Construction work on the plant, railroad and canal began in October, 1931. One of the first problems encountered was health conditions, and its solution presents a most interesting and important chapter in the development of the new enterprise. The plant site is located on solid ground at an elevation of about 4 meters above sea level at high tide. The railroad extends through a hilly country, overgrown with a heavy growth of trees and brush, until it reaches the quarry at an elevation of approximately 40 meters above sea level.

Between the plant and Guanabara Bay is an extensive stretch of mud flats, known as "Baixada Fluminense," partly covered by water at high tide and heavily overgrown with brush. This territory is especially unhealthy, being infested with mosquitoes, even the higher parts having numerous stagnant pools. The vegetation itself creates breeding places for the mosquito, and malaria is very prevalent among the population.

Before the location was decided upon the sanitary conditions were carefully considered. The Rockefeller Foundation, maintaining a laboratory in Rio, was consulted, and it was agreed that with proper care the territory could be made and kept entirely healthful and safe for all classes of people. On the recommendations of the Foundation a medical doctor was engaged as a regular member of the company's organization, in full charge of the work of sanitation and extermination of the malaria-carrying mosquito.

It is interesting to note here, that the mosquito does not travel great distances, and it is considered safe if all breeding places are eliminated within one mile of the places of habitation. The problem, therefore, consisted first of employing only men in good health, and second, of cleaning up, cutting the brush and filling all stagnant pools around the work.

During the construction period from October, 1931, to February, 1933, a total of 2,200 men were examined. Of this number 336 were found unfit and were rejected, while a total of 311 were found to be infected with malaria. Sanitation work was continuously and vigorously prosecuted. More than 3,000 pools of water within the territory were examined every month and

a total of more than 200 actual breeding places were definitely located and eliminated. Large areas of brush were cut down daily and the entire district kept clean.

The result of all these efforts was that not a single case of malaria has been found to have developed among the men in the employ of the company. This magnificent result not only assures that working conditions in connection with the company's operations will be entirely healthful and satisfactory, but in addition it has been established that the district in itself is healthful and the sanitary work of the company constitutes an important contribution to the development of the State of Rio de Janeiro.

Plant Layout

The general plant layout is shown on the attached plan. One kiln unit and corresponding grinding equipment constitutes the original installation, giving a plant with a capacity of 800,000 bbl. per year, with provisions in the layout for the installation of a second kiln and the necessary grinding equipment.

At the quarry at Sao José, the electric power is supplied by the Emprezas Electricas Brazileira at 13,000 volts and transferred to 2,300 volts through the company's substation. All shops, pumps, air compressors and other auxiliaries are motor driven.

The loading equipment consists of two electric full-revolving shovels equipped with 2¼-yd. dippers. One of these shovels is intended for stripping and the other for loading rock.

The railroad line from the quarry to the plant has a gauge of one meter (39.37 in.), so that equipment is interchangeable with the Leopoldina railway, which serves that section of the country. Seventy pound rails have been used with hardwood ties of local woods, and the track is heavily ballasted.

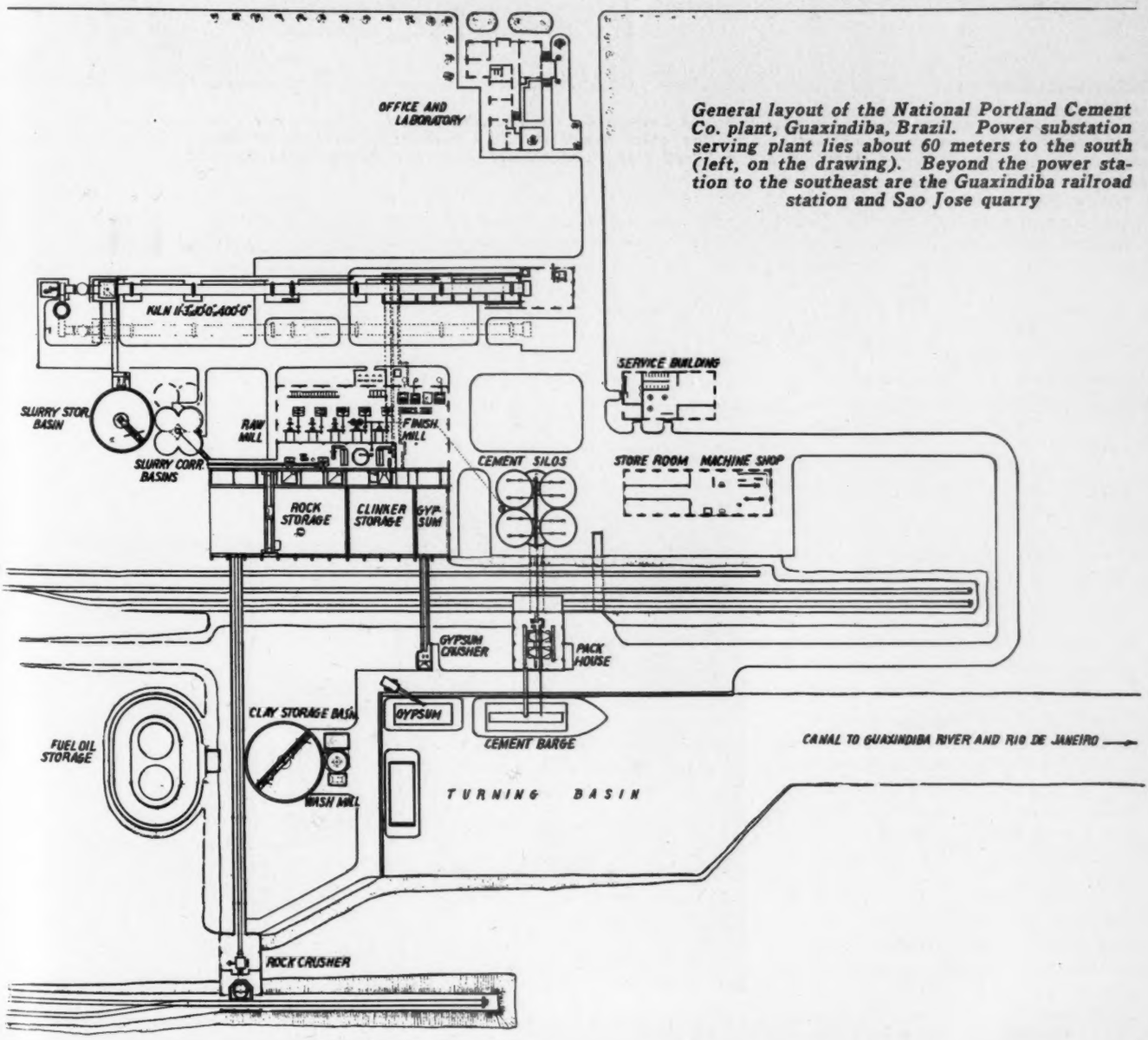
The rolling stock consists of four 12x18 four-wheeled locomotives for use in quarry and one 15x20 ten-wheel locomotive used on the main line.

The car equipment consists of fourteen 12-yd. Western type, side-dump cars used for dirt handling and twenty-five 30-ton, 8-wheel flat cars, each equipped with two V-shaped buckets holding 15 tons each, hinged on one side so that these buckets can be dumped individually.

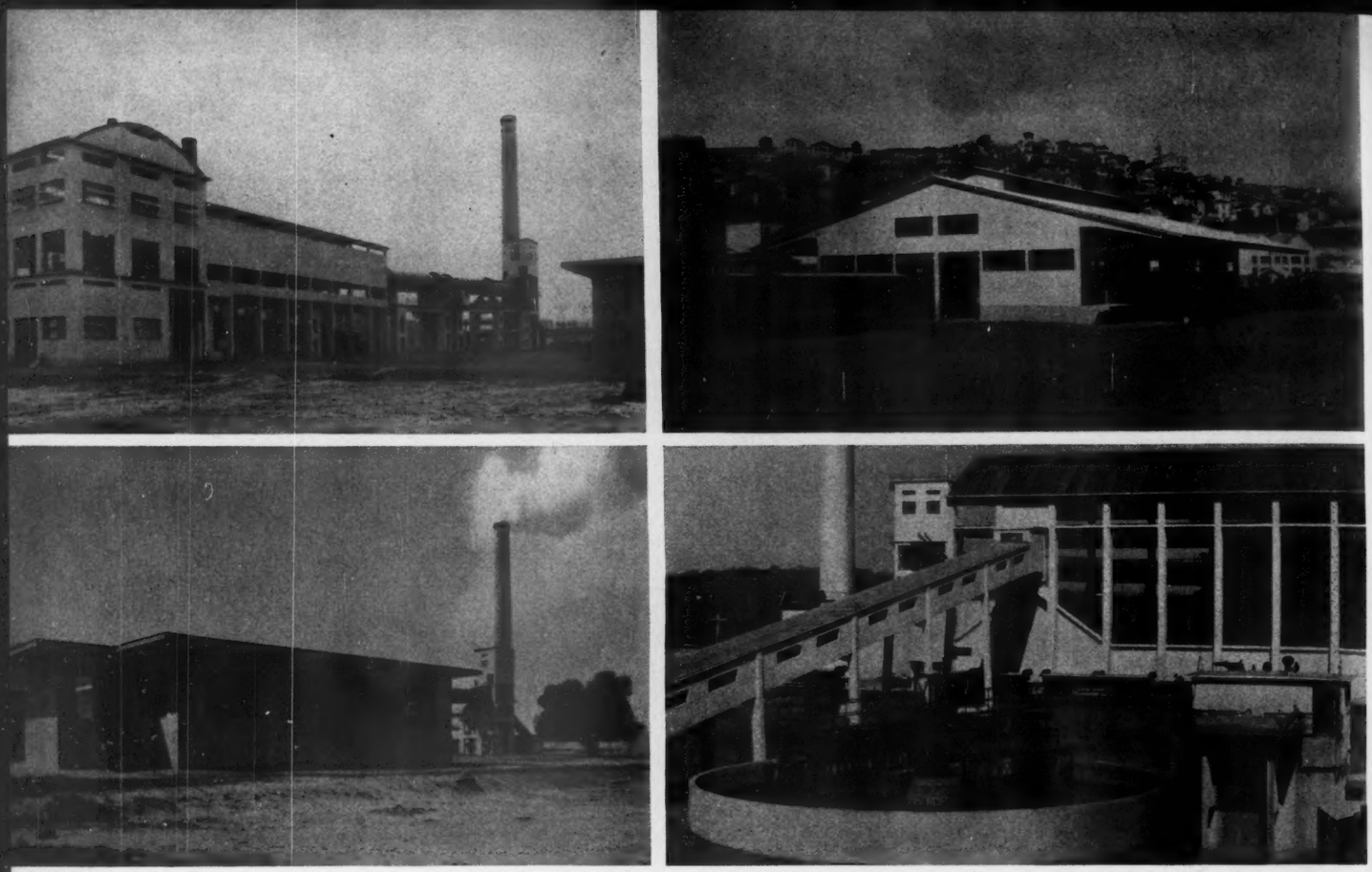
The cement plant proper is operating on the wet process. The rock cars from the quarry are delivered directly to the crusher floor, and the rock dumped into a 42-in. gyratory crusher. The buckets, holding 15 tons of rock, are dumped by means of an overhead electric crane.

The preliminary crusher discharges on to a pan conveyor, which acts as a feeder to a hammer mill with a movable breaker plate. The product of the hammer mill is transported on a 30-in. belt conveyor approximately 344 ft. long to the rock storage.

The rock storage is part of the general storage building provided for gypsum, clinker and raw materials. This is equipped



General layout of the National Portland Cement Co. plant, Guaxindiba, Brazil. Power substation serving plant lies about 60 meters to the south (left, on the drawing). Beyond the power station to the southeast are the Guaxindiba railroad station and Sao Jose quarry



Top, left: Kiln building of the National Portland Cement Co., Guaxindiba, Brazil. Top, right: Company's distribution station in Rio de Janeiro. Lower left: Concrete office building. Note ventilation and special design for tropical climate. Lower right: Wash mill and clay storage basin, also rock storage in background

with an overhead traveling crane, 75-ft. span, handling a 3-yd. clam-shell bucket, by means of which the raw material can be distributed in the rock storage. The crane also handles raw material into the bins over the raw mills.

The material from the Sao José quarry is high in lime and to correct this for a proper cement mix, clay dredged from the Bay at the mouth of the river is added. The clay is the material carried down by the Macacu River and deposited at the mouth of the river, and therefore constitutes a sludge or mud of very great fineness, which is loaded into barges and delivered through the canal in front of the wash mill. An electric caterpillar locomotive crane handles the clay from the barges into a 20-ft. wash mill, from where it is pumped into a clay storage basin 70 ft. in diameter. This basin is equipped with a rotating agitating apparatus designed by the company.

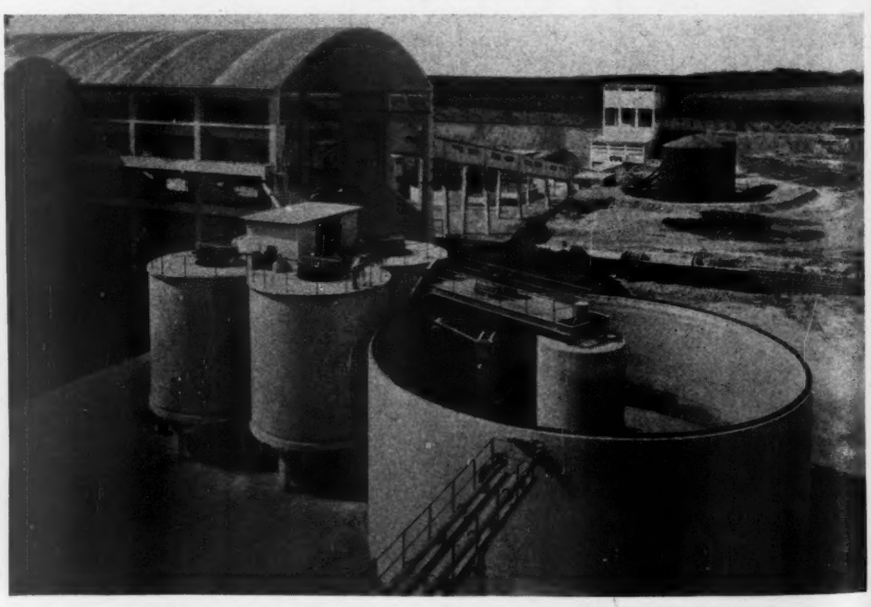
Slurry Grinding and Handling

The raw material from the storage is deposited in feed bins, and by means of table feeders into two 7x26 ft. combination mills, and clay is added at these mills by means of a clay feeding wheel adjusted to give the proper proportion. The mills are operated in closed circuit with vibrating screens, the fines from which are conveyed to correcting basins. These consist of four tanks 20 ft. diameter by 22 ft. deep, equipped with agitating equipment and circulating pumps, so that the slurry can be properly mixed and adjusted to the proper composition by blending the contents of the various correcting tanks. This slurry is then pumped back to the raw mill and passes through one 7x26-ft. tube mill for the final grind. From here it is pumped into the slurry storage basin 56 ft. in diameter by 25 ft. deep, equipped with special agitating and circulating equipment and having a total capacity of 5,000 bbl.

The slurry is pumped from the storage basins to the feeder located at the kiln feed floor. This feeder is of the Ferris wheel type, driven directly from the kiln and equipped with adjustments, so that a uniform feed at a predetermined rate can always be provided for the kiln.

Kiln and Controls

The kiln proper has a total length of 400 ft. Of this 300 ft. is 10 ft. in diameter, while the upper 100 ft. is 11 ft. 3 in. in diameter. This latter section is equipped with slurry drying chains, and the feed end of the kiln is provided with a gas outlet chamber of modern design, through which the gases are handled by means of a large draft fan controlled from the burner floor



Correcting basins and kiln feed basin at the plant of the International Cement Co. Brazilian subsidiary. Crushing plant and rock storage show in background

and so operated and regulated as to give at all times the required draft. This fan discharges the gases through a concrete chimney 10 ft. in diameter by 200 ft. high.

The kiln is fired with fuel oil. The oil is delivered in barge lots of about 3,000 bbl. from the large storage tanks of the oil companies on the Bay. Two storage tanks with a capacity of 3,500 bbl. each are provided. From these the oil is pumped as required to the burner platform, passing through oil heaters for preheating and through the oil meters and atomizers into the kiln.

A control board is installed for the complete control of kiln operations. This is located on the burner platform and informs the operator at all times of the condition of the feed, draft, speed of kiln, and rate of oil flow, as well as the combustion conditions, and provides means whereby the operator can adjust the various factors of operation, so that they are thoroughly synchronized for the best possible results under varying operating conditions.

Clinker Handling

The clinker is discharged into a rotary cooler 8 ft. x 9 ft. x 121 ft. long. This cooler is equipped with special agitating devices, and with an arrangement for breaking up the larger size of clinker as it passes through the cooler. The upper end of the cooler enters directly into the kiln and serves as combustion air. An outlet is provided for excess air from the cooler hood, this air being vented to the atmosphere through a cyclone dust collector to trap the clinker dust, and to assure the discharge of only clean air.

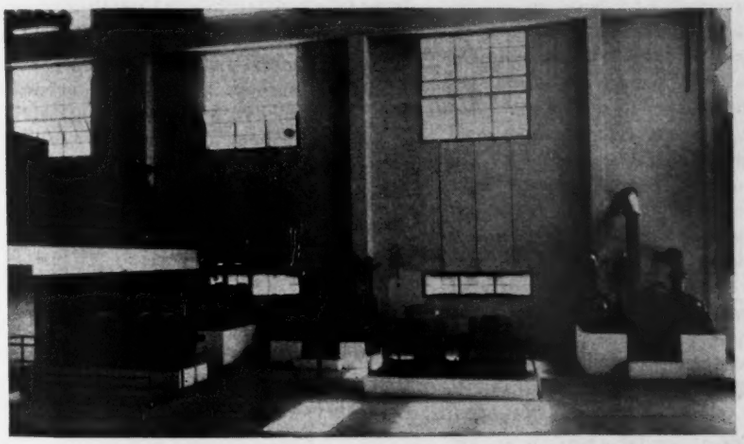
The cool clinker is discharged into a reciprocating conveyor, which carries it back under the mill building; and by means of an elevator into the clinker storage, where it can be handled by the overhead traveling crane in the storage building.

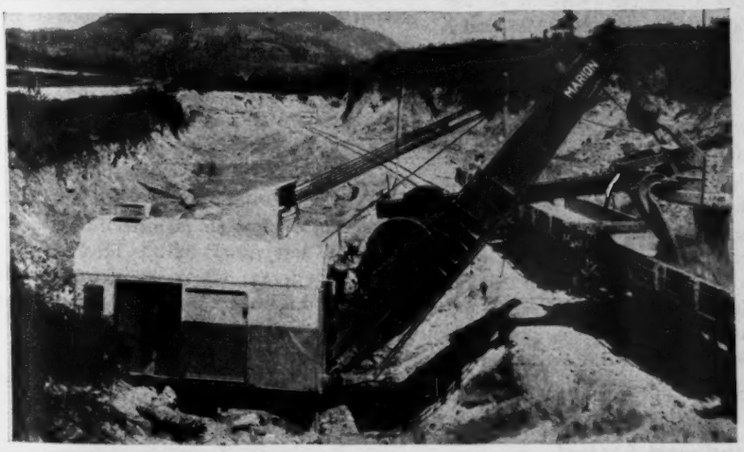
Clinker, as well as gypsum, are deposited in their respective bins above a 7 ft. x 26 ft. combination mill, the feed of which is controlled by table feeders. This mill is operated in closed circuit with a 16 ft. air separator; the fines are discharged directly into a 7 ft. x 26 ft. tubemill, which forms part of the clinker grinding unit. The finished cement from this tube-mill is transported into the storage silos by means of a pneumatic conveying system.

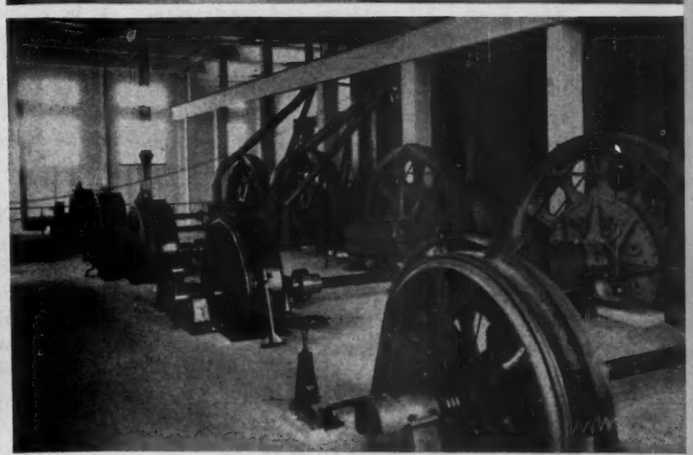
Packing and Shipping

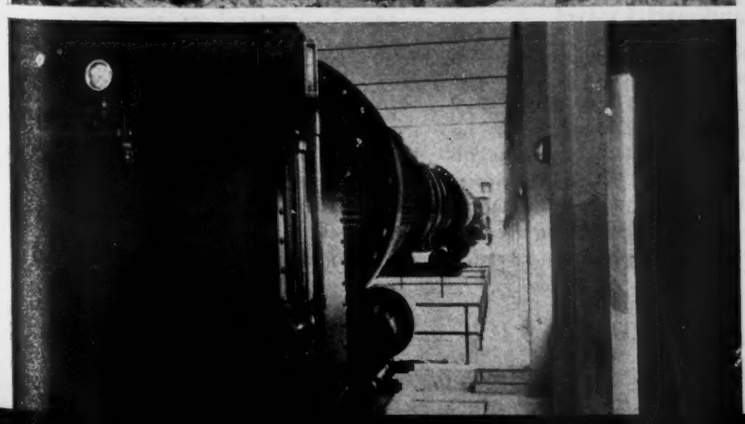
The cement warehouse consists of four concrete silos, 32 ft. in diameter by 80 ft.

Top, left: Rotary converters and compressor units in National Portland Cement Co. plant. Top, right: Concrete-roofed storage buildings for rock, clinker and gypsum. Center, left: Electric shovel loading overburden at quarry. Center, right: Grinding room interior. Lower left: Kiln viewed from burner platform. Lower right: Preliminary gyratory crusher followed by swing hammer mill









tall, which together with the interspaces have a total storage capacity of 75,000 bbl. Mechanical equipment is provided underneath these silos for extracting the cement and conveying it across the railroad tracks to the packing house. In this department are installed four valve-bag packers, and the packing department is equipped with facilities for packing the cement into paper bags or cloth bags, and for loading these either into railroad cars, trucks, and other vehicles, or boats and barges for water transportation.

In the city of Rio the company has established storage and distribution facilities in the railroad yards of the Leopoldina railroad, and cement for distribution in the City of Rio will be transported in railroad cars over the lines of the Leopoldina Railway from the plant to this warehouse.

The building which houses the offices and laboratory at the plant was especially designed to provide the most modern facilities and at the same time be suitable for the climatic conditions of the locality.

A building is provided for the machine shop and storeroom, and the shop is equipped with modern tools and equipment, making possible the repairing of any part of the equipment. The storeroom is equipped with special shelving and racks for the proper storing of supplies and parts.

Electric current both for the plant and quarry is obtained at 66 kilo volt tension lines from Companhia Brasileiras de Energia Electricas, and is transformed to the required voltages at an outdoor transformer station and distributed to the various parts of the mill and quarry.

The general layout and all engineering of the plant was done by the International Cement Corp.'s Engineering Department in New York. All buildings and construction throughout the plant are reinforced-concrete, done under contract by the firm of Christiani and Nielsen, Rio de Janeiro, and represents the most modern type of construction especially designed for economy and for the conditions prevailing in the tropical climate in which the plant is located.

The actual construction work of the plant was started in November, 1931, and the mill was put in operation on April 3, 1933.

The trade mark adopted by the Companhia Nacional de Cimento Portland for its product is "Cimento Portland Mauá," adopted in honor of Viscount Irineu Evangelista de Sousa Mauá (1813-1889), Brazilian financier and merchant, born in Rio Grande do Sul, founder of large enterprises and improvements in Brazil, such as the first railway line (Estrada Mauá) as also many others, illumination by gas, the submarine cable, the navigation company of Amazonas, etc. The cement has already won wide recognition in engineering and scientific circles in Brazil, and it can be confidently predicted that this new unit in the industry of Brazil will soon take an important place in the development of the country.

Farmer Support (?)—For a Consideration!

THE U. S. Senate Committee investigating ocean mail contracts has dug up some interesting data in connection with the lobbying and propaganda activities of the American Farm Bureau Federation.

S. A. Van Petten, in the Federation's information division from 1928 to 1932, but not now connected with the Federation, testified at the hearing October 17 that he ran a "secondary road institute" toward whose maintenance the asphalt industry contributed about $150,000 in three years.

In 1930 and 1931 the Portland Cement Association paid $3,000 along with other contributors "to cover the cost of a home modernization campaign."

For $94,750 the Federation offered to help the steamship companies get mail subsidies. They, however, "did not come across."

Gypsum

New Use for soluble anhydrite is described in *Industrial and Engineering Chemistry* for October by W. A. Hammond and J. R. Withrow, Ohio State University. The effectiveness of this new drying agent, anhydrous calcium sulfate in the form of soluble anhydrite, for the complete and rapid drying of organic liquids is described. The high affinity of this reagent for water present in large or small proportions in organic liquids, its insolubility in and inactivity toward these liquids, its neutral reaction, its physical and chemical stability, the ease of economy of preparation and repeated regeneration, and the wide range of its applications are pointed out. It is believed that this material has proved more versatile than any drying agent previously known. Exposure of the granules of soluble anhydrite to any organic liquid, either in the liquid or vapor phase, does not alter their form or size. There is a very slight dusting, owing to handling, but no tendency toward disintegration as in the case of calcium oxide. After use, the granules appear dry but carry the odor of the liquid to which they have been exposed. The vapor may be removed by gentle heating or ventilation, and the granules completely regenerated by heating in an oven for 2 hours at 230 deg. to 250 deg. C. Samples which have been regenerated and re-used repeatedly have shown no noticeable loss in efficiency or rate of extraction of water from organic liquids.

Sand and Gravel

Collier Cobb, Jr., road and bridge contractor, Chapel Hill, N. C., is the man who saved the portable sand and gravel plant operators from extinction, according to his home-town newspaper, which describes his efforts in organizing the National Association of Portable Sand and Gravel Producers. The local story says: "In the course of his efforts to build up an organization in rapid-fire fashion, Mr. Cobb bethought him of the men who sold the portable equipment. And their affirmative response to his appeal for co-operation was nothing less than explosive; for they became aware, all of a sudden, that they were threatened with having their market taken away from them. In the last six years these machinery men have sold about $50,000,000 worth of crushers and other portable equipment to contractors."

Publications Received

Quarry Accidents (United States Bureau of Mines, Washington, D. C., Bulletin 375). W. W. Adams, chief statistician, demographical division, describes, classifies and gives statistics of quarry accidents for the calender year 1931.

Petrography of Fuller's Earth Deposits, Olmstead, Illinois (State Geological Survey, Report of Investigations, No. 26). Ralph E. Grim gives chemical analyses, optical properties and relevant data on Fuller's earth; comparisons with material from other deposits; petrographic data bearing on theories of decolorizing ability.

Illinois Mineral Industry in 1932 (State Geological Survey, Report of Investigations, No. 28). W. H. Voskuil and Alma R. Sweeny present a preliminary statistical summary and economic review.

Hawke's Bay Earthquake (Bulletin No. 43, New Zealand Department of Scientific and Industrial Research, Wellington, N. Z.). Report on all phases of the earthquake of February 3, 1931, including damage to buildings; contains data of interest and value to promoters, designers and builders of concrete construction.

Potash (United States Bureau of Mines, Economic Paper 16). Bertrand L. Johnson presents a 74-page report on all phases of the potash industry in this country; including occurrence of potash in nature (kinds of rock, etc.); technology of potash-bearing raw materials; potash industry of the world.

A Study of the Properties of Texas-New Mexico Polyhalite Pertaining to Extraction of Potash (United States Bureau of Mines, R. I. 3210). This is Part VII—the effect of particle size, sodium chloride concentration, and temperature upon hot extraction by a multistage process, by J. E. Conley and F. Fraas.

Industrial Research Laboratories (Bulletin 91 of the National Research Council, Washington, D. C.). The fifth edition, compiled by Clarence J. West and Callie Hull; no producer of rock products can afford to keep out of touch with the research work being done in these industries. There are 44 research laboratories listed in this directory which do work largely or wholly in rock products. Of these 32 are maintained by private companies; and they are not all large companies by any means.

Notes on Screw Conveyor and Bucket Elevator Drives

By T. N. Haffner,
Bath, Penna.

WITHIN the last eight years, direct drives have practically displaced belts and countershafts for driving bucket elevators and screw conveyors. The combination of electric motor and speed reducer has proved so reliable and economical that only in plants grievously afflicted with lack of capital or intended to be used for only a short time have belts been installed in recent years. However, the chain connection between speed reducer and headshaft still exists.

Eight years ago the writer in conjunction with H. H. Leh, now manager of the Keystone Portland Cement Co., abandoned entirely the use of this connecting chain drive except in very special cases, and coupled all speed reducers direct to the driven machine. The new practice has met with complete success. Maintenance and operation costs are lowered and safety is measurably increased. In over a hundred installations without chains there have been no failures of reducers or motors, while the connecting chain drive has ruined two out of about 20 installations and shortened the life of several more.

Advantages of Chain Drives

In the discussion at the time of designing these drives, the many reasons brought forward in favor of the chain-drive connection reduced to three, as follows:

(1) Greater flexibility. This seemed to be the greatest. Suppose the plant output be increased so that more material must be transported. One simply buys a new set of sprockets to speed up the conveyor, installs them, and the job is done.

(2) It is easier to install. A reasonable difference in alignment is taken up by the chain.

(3) It is cheaper, as the speed reducer is less expensive because some speed reduction is made in the sprockets, and no flexible coupling is required.

After thoroughgoing analysis, the first reason was found to conceal several serious disadvantages. If the conveyor is run faster to transport more material, more power must be delivered by the motor, and it follows that either the motor was underloaded in the first case or overloaded in the second. Underloading lowers both the efficiency and the power factor, and the actual money loss may be greater for reduced power factor than for reduced efficiency, although not so obvious.

Over-Large Motors a Loss

The economic waste caused by installing induction motors too large for the work to be done is well illustrated by an installation made in a Lehigh district cement plant some years ago. An elevator and cross conveyor together were equipped with a 25-hp. motor, and each of two screw conveyors with the same size motor, all of this equipment delivering cement to a battery of storage silos. Underneath the same silo, three screw conveyors had each a 40-hp. motor, two cross conveyors each 25 hp., two elevators each 20 hp., and two screw conveyors to packing bins each 30 hp. motors. The total motor horsepower installed was 345, although the motors running at any time totalled only 280. The power consumed was less than half of this, with a power factor of about 55%. Three years after the original installation, all these motors were replaced by smaller motors, the used motors being installed at other locations in an expansion program. In the same sequence as above, the 25-hp. motor was replaced by a 15, two 25's by a 10 each, three 40's by three 25's, two 25's by two 15's, two 20's by two 10's and the two 30's by two 20's. The total installed horsepower was now 200, with 165 running at any time, consuming electrical energy at 80% power factor. With a demand charge of $1.50 per kw., the saving due to better power factor alone, figures out as follows. Billing demand—before change:

$$\frac{100}{55} \times 123 = 224 \text{ kw.} = \$336.00$$

After change:

$$\frac{100}{80} \times 123 = 154 \text{ kw.} = 231.00$$

Monthly saving on power factor only = $105.00

Considering that this saving could have been affected in the first installation by smaller, cheaper motors requiring smaller auxiliary equipment all around, the downright folly of over-powering machines with induction motors should be apparent.

Actual Power Requirements of Elevators and Conveyors

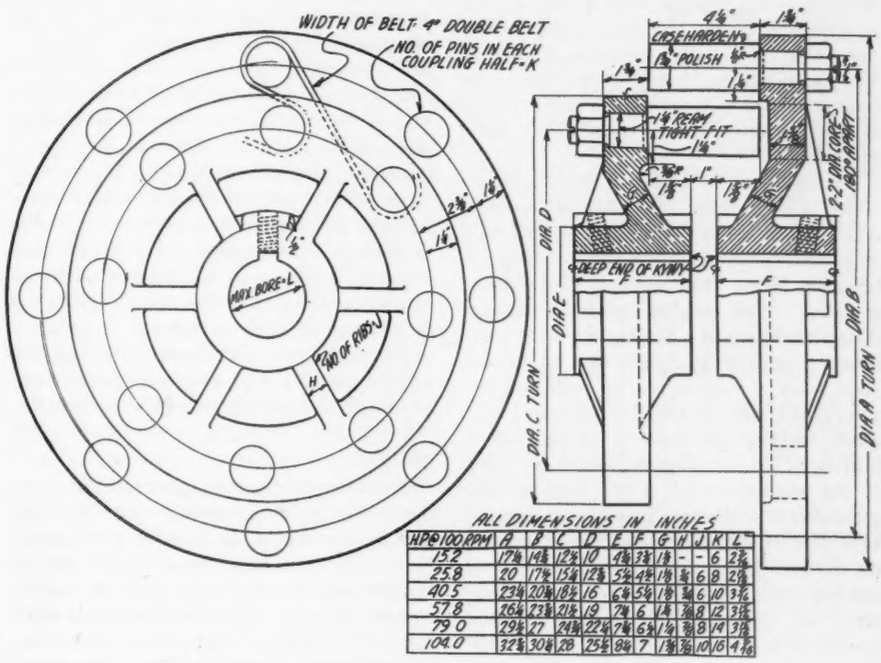
Careful readings were made of the actual power requirements of elevators and conveyors, the result closely checking the formula found in many conveyor and elevator catalogs:

Pounds per minute of material times distance conveyed in feet times 2, divided by 33,000 = horsepower of motor required, including drive losses if reducer is coupled direct. If chains or gears are interposed between the reducer and driven machine add from 7 to 15% for additional chain or gear and grease bearing losses.

Capacities were figured at half the theoretical displacement for screw conveyors, buckets half full for elevators, when delivering maximum amount of material.

Overloaded motors have a short life, the shortening being in greater ratio than the overloading. It will be found, however, that a motor moderately overloaded at infrequent times and not too long duration (as a motor driving a conveyor under a battery of storage silos might be loaded) is much to be preferred to a motor so large that it is not overloaded when emptying the farthest silo. The overall economy will be found to be better.

In these days of economy it also behooves one to check closely the efficiency of speed



HP@100 RPM	A	B	C	D	E	F	G	H	J	K	L
15.2	17⅛	14⅝	12⅞	10	4⅛	3⅜	1⅛	-	-	6	2⅝
25.8	20	17⅛	15⅛	12⅝	5½	4⅜	1⅛	⅜	6	8	2⅛
40.5	23¼	20⅛	18½	16	6⅛	5⅛	1⅛	¾	6	10	3⅛
57.8	26⅛	23⅛	21⅝	19	7⅛	6	1⅛	⅜	8	12	3⅝
79.0	29½	27	24⅛	22⅛	7⅞	6⅝	1⅛	⅜	8	14	3⅞
104.0	32⅝	30⅛	28	25⅛	8⅛	7	1⅜	⅜	10	16	4⅛

Diagram and tabular data for flexible coupling design

reducers, and to demand guaranteed performance before purchasing them. Get two-speed reducers, one with an efficiency of 95%, another 85%. Connect them with machines requiring 17 hp. each, and run the whole 360 days of 24 hours each, as a good cement man would. The 95% efficiency reducer will use per hour 13,350 watts, the 85% reducer 14,920 watts, a difference of 1,570 watts. In our 360 days run the difference will be 13,565 kw.h., and at $0.009 per kw.h. will be paid for with 122 dollars of somebody's money. Suppose this 85% efficiency reducer lasts 10 years. It will have eaten up $1,220 worth of good electrical energy more than the 95% efficiency reducer, giving out heat in return.

From the foregoing paragraphs, it will be seen that the motor and reducer should be fitted closely to the job. If speed changes are required, and this is done much less frequently than chain-drive proponents would have one believe, change the motor. Motors are fairly cheap and last a long time. For original installation motors of synchronous speed of 900 r.p.m. will usually be found to provide best overall economy, including the reducer. Replace, in case it is ever necessary, with 1,200 or 720 r.p.m. motors in the same frame size as the original, and in this way keep the power requirement in the same ratio as the speed.

More About Chains

The second reason for using the chain has, in a way, some merit. A roller chain will work if it is not perfectly lined up, but the practice is not recommended by chain manufacturers. Cheapness, the last reason for adding the chain, we did not find to be the case. Some speed reduction is made by the chain sprockets, which at times permits a smaller, less costly reducer to be used, if the pounding of the chain on the sprocket through to the reducer bearing and gearing is neglected. In the best drive-chain installations this continual hammering is allowed for, and it will be found that the size of the reducer is just as large as if it were coupled to the conveyor direct without the chain reduction.

Furthermore, an outboard bearing is required with a chain which a direct coupling does not need. The cost of this bearing with its mounting, two sprockets and the chain will be much larger than the cost of a flexible coupling. The coupling guard is cheaper than a chain guard. Finally, the floor space direct coupled is less than with chain, and floor space at conveyor drive ends and elevator head ends is usually expensive, as a whole building may have to be enlarged to provide it, or an unsightly lean-to provided. It has seemed to the writer that in some chain-drive installations he has seen it would have been cheaper over a period of years if the designer had coupled his reducers direct and immediately bought all the motors necessary for expected speed changes, even though these motors had never been used.

Another objection to the chain-drive connection is the heavy side pull which must be

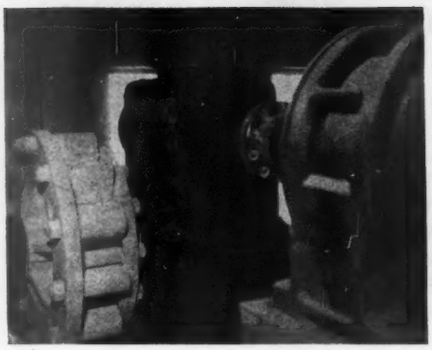


Fig. 1—Bucket elevator drive

provided for in the structural base itself and in all machinery connections. As an illustration, consider a conveyor 16 in. diameter and requiring 22 hp. at 50 r.p.m. First, suppose a 32-tooth sprocket for SS-40 chain is tried. The pitch diameter is 31¼ in. The distance from the center line of conveyor to the base of conveyor would be about 10¼ in., so the 32-tooth wheel would require either a pocket in the floor or the whole conveyor to be raised not less than 6¾ in. Let's compromise, as has often been done on the job for this very reason, by raising the conveyor 4½ in. and reducing the sprocket size to 28 teeth, which is 27½ in. pitch diameter. The pull on the chain to transmit 22 hp. with this sprocket allowing 4% for loss in one-half of the chain drive, will be 2,100 lb., with a certain amount of shock due to the chain engaging the sprocket teeth. If all parts are not rigidly doweled to place this pull of over a ton will overcome the frictional resistance of fastenings, disalignment results, and trouble naturally follows.

Designing a Flexible Coupling

The search for a suitable flexible coupling followed immediately on the heels of the decision to drive without chains. There are now and have been for years many good couplings on the market. However, the makers pointed out that they were making flexible couplings, not universal joints, and demanded that the misalignment between the reducer shaft and the driven machine shaft be kept much smaller than is the common practice in cement plant elevators and conveyors. It is not at all uncommon for a screw conveyor or elevator head bearing to be worn down 3/16 in. before it is replaced, and this will ruin almost any coupling. We early found one type that would give good service in this application, and that was the old belt or rope type, improved for the occasion.

The accompanying table gives all necessary dimensions for the commonly used sizes. The 57.8-hp. size was designed more particularly for bucket elevators using large shafts. Parallel misalignment may be ¼-in. maximum in all sizes. Extra flexible double belts fastened by alligator fasteners are used. The pins are of large diameter, case-hardened and polished. Soft pins should not be used as they will be cut by the belt and the belt then rapidly destroyed. If the recommended horsepower per 100 revolutions is not exceeded, the belt replacement will be a matter of years. The outside rim used on older couplings of this type has been eliminated to make installation and replacement of belts easier, as safety practices in common use demand a guard whether such rims are used or not. The outside diameter should be turned straight and to dimension to facilitate lining up.

A flexible coupling of this type made of cast steel and carefully balanced was installed on a very heavy hammer mill in February of 1930, between the main shaft and the motor, at the request of the hammer mill manufacturer. Over two hundred times a day, the load rises in a few seconds from 17 to about 450 hp. at 685 r.p.m. Two belts for this coupling were purchased at the same time, one for original installation and one for spare. The original is still in use showing very little sign of wear after crushing over one million tons of rock.

For conveyors the thrust bearing should be placed at the drive end. The simplest type that gives good results seem to be a plain hardened and polished steel washer bearing against one face of the head bearing. This may be placed inside of the trough to take thrust for a "pushing" conveyor, or on the outside for a "pulling" conveyor. In the first case, the conveyor pipe on which the flights are mounted bears directly against the thrust washer. For a "pulling" conveyor a collar should be turned on the head shaft between the flexible coupling and the head bearing with the thrust washer between the collar and the bearing face. It is very important that wear in the thrust be not permitted to force the head shaft or its coupling against the reducer shaft or its coupling, as this may seriously damage the reducer.

Screw Conveyor Drives

The thrust is sometimes taken up at the tail shaft, but this is inadvisable. Some power is unavoidably absorbed in any thrust bearing and the nearer to the drive end this power is absorbed the less the strain and wear to which the entire length of conveyor is subjected. Another reason for taking up thrust at the drive end is the tendency for materials like cement to pack solidly in the conveyor trough if they are not kept moving. So long as cement is kept in lively motion it remains light and fluffy, flowing almost like water. If for any reason motion ceases, the untrapped air is squeezed out and the cement packs so hard in the space of 20 or 30 minutes that it is impossible to start the entire conveyor again without digging out the packed cement. If in such a case the drive and thrust are at the "pulling" end, several sections of conveyor flights may be disconnected at the hangers and the packed material pulled out in sections. It may take

several hours to "dig out" a stalled conveyor by hand.

Screw conveyors carrying hot materials should always have the thrust at the drive end. With a difference in temperature of 100 deg. F. between the screw and trough the screw would be just one inch longer in 125 ft. of conveyor, and it is much the easier and better way to allow for this expansion at the tail end.

Do not install a speed reducer anywhere for any service without providing a flexible connection at each shaft. Early failure of the reducer or motor or both is almost certain to result if this caution is not heeded. The connection will be a flexible coupling, preferably, although belt, chain or gear may be substituted with some degree of satisfaction.

Fig. 1 shows a drive for a bucket elevator as installed at the Keystone Portland cement Co. plant at Bath, Penn. The calculations on which this drive is based are:

18 in. by 8 in. by 8½ in. malleable iron buckets, spaced alternate links on 6-in. pitch chain (this is about the closest possible spacing) @ 250 ft. per min. chain speed, cement at 85 lb. cu. ft., buckets half full, will deliver 660 bbl. per hour, equal to 4,136 lb. per min. The elevator is 63 ft. high from floor to center of headshaft.

$4136 \times 63 \times 2/33000 = 15.8$-hp. motor required. Motor used is 15 hp., 900 r.p.m. synchronous speed, 865 r.p.m. full load speed, with a Cleveland No. 500 worm gear reducer 28½ to 1 ratio.

Fig. 2 shows the drive for an 18-in. diameter 18-in. pitch screw conveyor capable of delivering over 800 bbl. of cement per hour at 45 r.p.m. The length of conveyor is 26 ft. and 800 bbl. per hour at 85 lb. per cu. ft. is 5,000 lb. per min.

$5000 \times 26 \times 2/33000 = 7.9$-hp. motor required. The motor actually installed is 10 hp., 865 r.p.m. full load speed, with a Cleveland No. 200 worm gear reducer, 19½ to 1 ratio. The low speed couplings in both illustrations have been taken from the table in this article. Fast's flexible couplings were used between the General Electric motors and the speed reducers.

Stone Dust for Coal Mines

AN International Conference on mine safety research was held at Buxton, England, and a report of the meeting has recently been published by the Bureau of Mines as Information Circular 6670.

This meeting was of particular interest to coal mine operators, although there was a brief discussion of the application of stone or rock dust for prevention of coal dust explosions. It was decided to defer detailed discussion of this subject until another conference.

Regarding the testing of the physical condition of stone dust, a number of methods were suggested. Humid or moist conditions in mines sometimes are so great that the stone dust cakes, thereby taking away the efficiency of the treatment. The problem was divided in these phases: (1) The greater susceptibility of some rock or stone dusts than others to absorb moisture; (2) a difference in the hardness of caking when moistened; and (3) a difference in the dispersability of rock dusts by air waves or by blasts, of an explosion, when these dusts have been previously wet and then dried by the air currents.

Fig. 2—Screw conveyor drive

It was agreed that none of the empiric methods now employed were satisfactory and it might well be a problem for an international cooperative study to develop test methods that might be standardized and capable of being employed quickly and conveniently by mining companies for the selection of a rock dust least affected by humidity for use in their mines.

Detecting Organic Impurities in Sand with Photo-Electric Cell

THE ORDINARY (Abrams - Harder) method of detecting organic impurities in sand is to digest the sand in a dilute solution of sodium hydroxide and to compare the resulting color with some printed color plates. For a laboratory process this method is refined by comparing the color obtained from the sand with that produced by known solutions of tannic acid and sodium hydroxide.

This method is sufficient for field tests and for ordinary laboratory investigations. But in Bulletin No. 28 of the Maine Technology Experiment Station it is stated that the method is insufficient for a statistical study of sands. The authors, H. Walter Leavitt and Weston S. Evans, have been engaged for some years in such a study of sands, tabulating the results to determine the effect of every characteristic on the strength and durability of concrete. Each year their studies have borne fruit and an application of their methods now enables them (with few exceptions) to forecast quite accurately the mortar strength of the sand with a known cement.

For such work an accurate determination of the organic matter present is essential so they have refined the method given above by using a photo-electric cell to detect the depth of the color. A simple apparatus made of an old camera allows the light from a bulb to pass through a beaker filled with a solution and this affects the passage of an electric current as shown by a micro-ammeter. A close adjustment can be made by moving the light up and down until the micro-ammeter reads 10 for distilled water. With a black liquid the reading is zero. Readings can be made to hundredths.

The authors say that this method gives a wide range of readings, very accurate readings and very consistent readings, as is proven by many check determinations. All the personal factors are eliminated, as the electric eye gives an exact measure of the light transmitted through the liquid to be tested.

Aggregates for Cement Bound Macadam

THE Portland Cement Association is making extensive investigations of the possibilities of cement-bound macadam for secondary highway construction. A test pavement was laid this summer near Elmhurst, Ill. Preliminary conclusions are:

(1) Crushed stone, pebbles and slag make satisfactory coarse aggregates for cement bound macadam.

(2) Coarse aggregate ranging from 1 to 2 in. in size is satisfactory for cement bound macadam. Aggregates of smaller size are more difficult to penetrate.

(3) Grout proportioned 1:2, by weight, is satisfactory from the standpoint of both penetration and strength.

(4) Sands having not more than 5% retained on the No. 8 sieve, and 10 to 20% passing the 50-mesh sieve, are satisfactory for the mixes tried. Coarser sands segregate more readily; finer sands require more water.

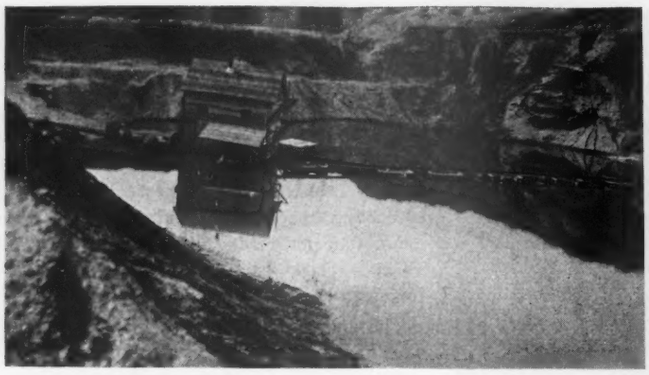
(5) Rolling prior to grouting reduces the voids and the amount of grout required, and produces a smoother-riding surface, but is not essential to cement bound macadam construction. It increases the loss of stone in the subgrade.

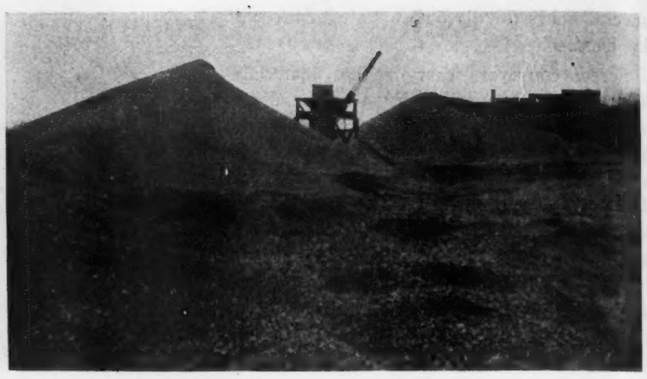
(6) Slabs 8 and 10 in. deep can be grouted perfectly.

Portland Cement Yardage

AWARDS of concrete pavement for July and for the first eight months of 1933 are announced by the Portland Cement Association as follows:

	Sq. yd. awarded during Sept., 1933	Sq. yd. awarded to date, Sept. 30, 1933
Roads	4,825,889	22,450,378
Streets	935,232	3,119,782
Alleys	3,676	127,870
Total	5,764,797	25,698,030





Left: Suction line of Spicer Gravel Co. Right: Excess sand in storage under present system

Problems of Small Gravel Operation and How It Is Proposed to Solve Them

By John H. Spicer,

Plant Superintendent, Spicer Gravel Co., Marseilles, Ill.

OUR PROBLEMS in many respects are characteristic of our location, deposit, and plant layout, the three very vital facts upon which the success of every plant depends. Most of these problems discussed below are problems which all small producers are faced with to a certain extent.

The main power plant consists of a 100-hp. Fairbanks-Morse semi-Diesel engine driving an 8-in. Morris pump, which delivers the material direct to the bins. The Diesel is the stationary type, so as time went on the suction line increased in length, gradually cutting down production through trouble from stones catching in the pipe and overloads causing loss of prime, etc.

We overcame some of the difficulty by underslinging the pipe, carrying it entirely submerged. Small leaks many times overcame the overload problem by letting in enough water to keep the pump primed until it could move the load. But because of the inconvenience of pipe extensions, especially in the spring and fall when the water was very cold, we changed the whole line, carrying it about 12 in. above the water. By lowering the pump to the water level we managed to maintain fair production but at best it was only a temporary improvement.

Our siding is 22 ft. above water level and the discharge on top of the bin is 28 ft. above the siding, making 50 ft. of lift with 300 ft. of pipe line. This makes quite an overload for the Diesel and has caused some trouble with it. It has given, however, satisfactory service to date in spite of this abuse. Relieving this overload was one of the determining factors in deciding what change to make in our plant design.

A state highway splits our plant in two. The deposit is on one side, just across the road is the bin and then the siding. The highway, while making hauling conditions very desirable, cramps stock pile arrangements.

The present storage system consists of three old wooden bins of 45 cu. yd. capacity each. We make two grades of sand and one of gravel. These small bins have made continuous operation impossible. The business has never warranted extensive stock piling equipment, so that under the present system considerable time is lost in stock piling and emptying the bins in the preparation for production.

An item which cuts into the profits and has proved to be quite a problem was the disposal of excess sand. Our deposit runs about 60% sand. We make a very good grade of fine sand and have been able to dispose of most of it at fair prices. But when producing for road jobs the excess of sand is so great that the disposal of it becomes quite a serious matter. We are faced with two alternatives, either sending it to the market at dumping prices or stock piling the material in hopes of better future market, the latter of which is costly and when added to a reloading charge necessitates a still better price, or finally selling at a loss which is increased by interest on investment necessary for stock piling equipment and on fund of working capital tied up in the production and storage of this excess, and made even more serious in our case because of a shortage of working capital.

We have had several different plans to overcome most of these defects; they consisted mainly of the construction of a large storage plant across the track from the present one. This would not eliminate the overload on the Diesel. We tried gasoline power direct connected to the pump, putting the whole unit on a barge. This improved production some but the cost was prohibitive. It burned 15 gal. of gasoline for which we were paying 17c, and ½ gal. of 60c oil per hour, while the Diesel under the same conditions would burn 7½ gal. of 8c distillate and 1 quart of 50c oil an hour. Besides, the plant had to be shut down at least one day a month for valve grinding and minor repairs.

We approached the power companies for a rate on current. Their rate per kw. we

Operating Man's Forum

***THE AUTHOR** presents a concise, frank statement of operating problems he has had to meet —and how he proposes to solve them.*

While he does not say so, we feel sure he would like to hear from other superintendents or operating men as to how they have solved, or would solve, similar problems.

We are entering a period of industrial cooperation in a sense never before realized. One practical means of cooperation is the exchange of operating experience.

The best way to exchange experiences is by visits and conversation, or at conventions of the industry. The next best way is through these columns in Rock Products.

So the editor earnestly requests other operating men to submit their problems—with or without their own solutions. And we hope that such problems will find many men with experience to offer advice and suggestions.

—The Editor.

thought was far too high. They also wanted a binding contract with a minimum charge for the year, the amount of which would, we estimated, pay for a Diesel power plant in five years of sufficient size for our needs and leave enough to pay a good share of the operating expenses of the engine during that time. It has great advantages in its convenience and elasticity, but the high price overcame all these advantages for us. Our territory is not large and production necessarily fluctuates with sales. A slow year would make the power bill a heavy burden.

The change over from the present power units to electric would mean a small additional investment. Under ordinary circumstances this would not be considered. The present storage plant is too small even for present production. Increased production to a satisfactory degree could not be obtained without a new storage system. Thus one thing calls for another, and the two would be quite an item at this time—that is from the investment angle.

The nature and location of the deposit makes large-scale production improbable and for this reason outside capital would not be interested in investing. We believe, however, that if the plant is properly laid out without increasing the investment more than a small sum, it will pay.

Thus, when we sum up the whole problem, there are three main features which are undesirable and which must be overcome.

1. Cutting the power requirements to meet present power capacity.
2. Devising some method of disposing of excess sand.
3. Building a storage plant that will operate economically and still take care of production efficiently.

The following plan will, we believe, accomplish the purpose. A new storage plant is to be erected at the water's edge as low as possible and still give us the necessary capacity. It is to consist of two bins for gravel with a capacity of 175 cu. yd. each. The sand will pass on with the water to dewatering units set up on legs 28 ft. high. After dewatering the sand will be dropped on the ground in two separate piles.

This plan of putting the sand on the ground was one that came in for considerable discussion. The greatest argument against it was that all the material would have to be reloaded by a loader or crane. On the other hand we have an old Barber-Greene loader which owes us nothing and will still load material. We can get, under this plan, storage capacity for about 250 cu. yd. of each grade of sand. A very important item considering our surplus of sand. Also this large capacity for storing will allow us to run our plant 10 hours continuously without rehandling any of the material. In case of an extremely large surplus accumulation of sand, as mentioned before, that occurs when producing for jobs calling for concrete materials, a chute can be erected to conduct the sand out into a worked out part of the pit. The room is almost unlimited and it can remain there indefinitely or be reclaimed at any time by turning the suction nozzle of the pump into it.

A car loading platform will be erected 300 ft. west of the plant. The incline up from the plant will be very easily negotiated. It will be only about a 9% grade. This part of the plan in operation in itself shows up on the red side of the ledger but is easily offset by some advantages to be shown below. Only about 30% of our entire production is disposed of by car shipment.

The total lift will be cut from 50 ft. to 35 ft. and the discharge will be 160 ft. as compared to 300 ft. under present conditions. This reduction plus the removal of several elbows from the line will cut the power requirement for the dredge pump about 35%. The Diesel will be coupled to an electric generator. It will produce sufficient current for the screens and a small hoist at the nozzle, besides the dredge pump. The crusher and other small operations will be run by gasoline engines.

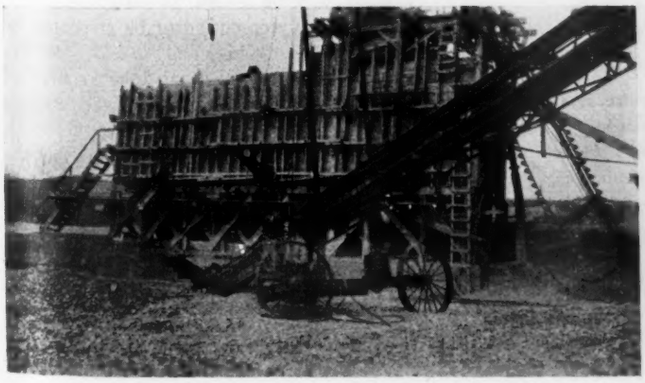
The hourly production with this layout will increase about 20%. This will eliminate the necessity of carrying a certain amount of stock piles during the operating season, to insure service. Because of the large storage capacity in the plant itself the amount to be rehandled for winter storage will be cut 30%.

Now for some figures on the expected profits of this change. A 20% increase in productive capacity with the present equipment will increase profits $12 per day. Elimination of stock piles to insure service and reduction of amount to be rehandled for winter storing will increase profits $4.25 per day. The cheaper method of handling excess sand will increase profits $1.50 per day or a total of $17.75 per day. Against this deduct $6 per day for trucking material to cars for loading, and $2 per day for cost of trucking winter stock pile across the road, a total of $8 per day. These figures result in a net gain of $9.75 per day. As yet these amounts are theoretical. However, no mention has been made of other smaller advantages such as elimination of gasoline engine to run screens, etc., so we firmly believe that this change in plant layout will always result in a substantial sum on the black side of the ledger.

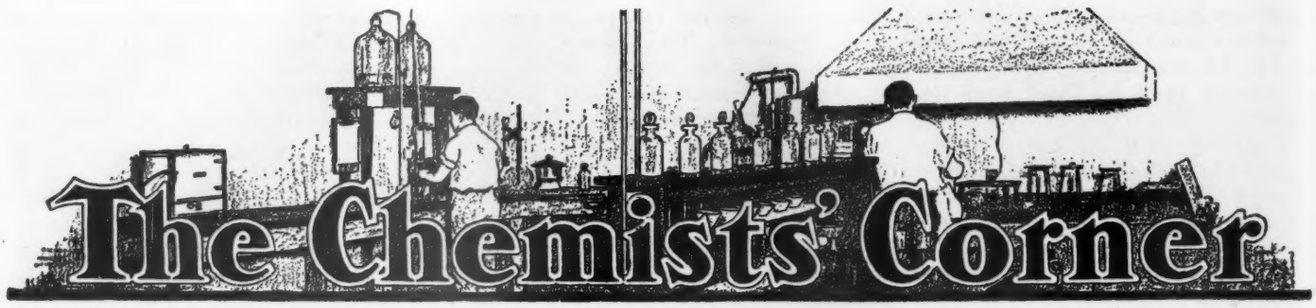
This layout is to our minds the most suitable to all our various needs. The power requirement is within easy reach of present power capacity. Storage of excess sand can be accomplished, in unlimited quantities, very cheaply without additional investment in equipment. The live storage system will be economical to build and efficient to operate. The total investment should not exceed $3,000.

Construction

THOMAS S. HOLDEN, in charge of statistics and research of the F. W. Dodge Corp., New York City, in a recent address in Chicago, Ill., said: "Construction has been steadily increasing since May until the September total of contracts actually let was the largest for any month since September, 1932. The increase in contracts awarded was mainly in residential and factory work, which, he pointed out, are the most important indicators of recovery. "Private construction work has been on the increase, as compared with last year, ever since May; a sustained improvement for five months," said Mr. Holden. "The month of May also saw a big increase in the volume of new plans for contemplated projects, much of it in anticipation of the federal public works program."



Left: ***Bin and conveyor for stock piling at Spicer plant. Siding is just beyond conveyor base. Right: Looking into pit from top of bin***



The Particle Analysis of Cement and Gypsum by Sedimentation

By Wallace C. Riddell,
Chemical Engineer, Standard Gypsum Co., Inc., San Francisco, Calif.

MOST of the work done on the application of sedimentation for the determination of particle size in fine grained materials is based on the original work of Sven Oden[1]; Svedberg and Rinde[2] have reviewed this work in a more available source. Other work by Schwrecht[3], Kelly[4], and Kraemer and Stamm[5] has added materially to this problem and is readily available for reference.

Oden weighed the amount of sediment accumulating, at a given point, on a suspended plate on a balance. Svedberg and Rinde used an electrical device for maintaining the balance in equilibrium instead of counter weights as used by Oden.

Schramm and Scripture[6] developed a method of sedimentation in a series of large test-tubes the data from which they used to plot curves for amount of sedimentation and particle size.

Taylor[7] has recently described a method for determining the "Flour in Cement" by a simple sedimentation apparatus. He gives a formula for Stoke's law and density and viscosity values for absolute alcohol which is used as the sedimentation medium.

Numerous other articles have been published on this subject several of which have appeared in ROCK PRODUCTS.

All of this work depends on the validity of Stoke's law and fundamentally is based on the work of Oden. He gives comparative figures for particles of different micron diameter calculated according to Stoke's law as compared to measurements with the microscope. For diameter of particles larger than 10 microns, Stoke's law can be applied with a satisfactory degree of accuracy. He defines the term r in Stoke's law as the "mean effective radius."

According to Stoke's law,

$$r^2 = \frac{9}{2} \frac{u\,h}{g\,t\,(s-d)} \qquad (1)$$

Where

r = the radius of the solid material in cm.
s = specific gravity of the solid material in gms. per cm.[8]
d = specific gravity (density) of liquid medium per cm.[8]
u = viscosity of liquid medium in CGS units
h = height of fall through liquid medium in cm.
t = time in sec.
g = acceleration due to gravity = 980

and

$$9uh = r^2\,2gt\,(s-d) \qquad (2)$$

$$h = \frac{r^2\,2gt\,(s-d)}{9u} \qquad (3)$$

$$t = \frac{9\,u\,h}{r^2\,2g\,(s-d)} \qquad (4)$$

and where $t = 1$ sec. the height of fall in 1 sec. or terminal velocity $= ht_1$

$$ht_1 = \frac{r^2\,2g\,(s-d)}{9u} \qquad (5)$$

Equation (4) is the more useful statement of Stoke's law. By substituting in this formula selected values for h and r and known values for the other constants, t can be calculated, which gives the time of sedimentation in seconds required for the definite particle size selected.

For sedimentation experiments care must be exercised in selecting the liquid medium used. The density and viscosity of the liquid must be known or accurately determined and these factors vary sharply with change in temperature. Several liquids are available for sedimentation determinations with cement and gypsum such as absolute alcohol, methyl alcohol, acetone, kerosene. In my work I have used denatured grain alcohol C_2H_5OH (sold as 188 proof for burning purposes only). This had a density of 0.808 at 25 deg. C. and gives very satisfactory results with both portland cement and gypsum. It can be used over and over again by filtering by suction through a properly prepared Buchner funnel, using masserated filter paper or asbestos. Evaporation of 100 cc. to dryness after use for approximately sixty determinations on cement gave a residue of 0.016 grams. The residue was a brownish black tarry mass. The density was 0.8087 at 25 deg. C.

The density and viscosity of several sedimentation liquids are given in Table I.[8]

Several forms of sedimentation tubes were devised and tested. The most practical one from the standpoint of ease of manipulation is shown in Fig. 1. Fig. 2 is a photograph of the set-up of the apparatus. The particular ease with which the remaining sediment in the bottom of the tube can be removed without loss, the small quantity of remaining liquid necessary to filter off or decant, and its simple construction makes this particular design of tube worthy of mention. Instead of using a cork, as shown in sketch, a large bore stop-cock can be cemented on to the end with rubber and Kotinsky cement. If one is unable to have this tube constructed by a glass blower, a hole can be bored into a piece of glass tubing with a file, turpentine and emery dust and the siphon sealed in with rubber and Kotinsky cement.

The manipulation of the apparatus is as follows:

A 2-gram sample is weighed into the sedimentation tube which is then filled to the desired height. A sedimentation height of 15 cm. is well within the required limit of error as the height of column can be read within one millimeter. Agitation by compressed air or by a small syringe bulb is

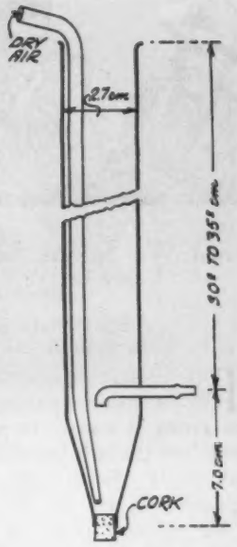
[1]Oden, *Proc. Roy. Soc.* Edinburg **36**, 219 (1916).
[2]Svedberg and Rinde, *Jour. Amer. Chem. Soc.* **45**, 943 (1923).
[3]Schwrecht, *Jour. Amer. Ceramic Soc.* **4**, 812 (1922).
[4]Kelly, *Ind. Eng. Chem.* **16**, 928 (1924).
[5]Kraemer and Stamm, *Jour. Amer. Chem. Soc.* **46**, 2709 (1924).
[6]Schramm and Scripture, *Jour. Amer. Ceramic Soc.* **8**, 243 (1925).
[7]Taylor, *Rock Products*, April 9, 1932, p. 46.
[8]From Smithsonian Tables or see Handbook of Chemistry and Physics published by The Chemical Rubber Co.

TABLE I—DENSITY AND VISCOSITY OF SEDIMENTATION LIQUIDS

Temp. deg. C.	H_2O Vis. u	H_2O Density d	C_2H_5OH Vis. u	C_2H_5OH Density d	CH_3OH Vis. u	CH_3OH Density d	C_2H_5OH (188 p.) Vis. u	C_2H_5OH (188 p.) Density d
0.....	0.019	0.9998	0.01770	0.80625	0.00813			
5.....		.9999						
10.....		.9997	.01449	.79788		.802		
15.....		.9991				.798		.815
20.....	.010	.9982	.01192	.78945	.00591	.794	.0117	.811
25.....	.009	.9970	.0110	.7852	.0057	.7875	.0108	.808
30.....		.9956	.0099	.7767		.779		
40.....	.0065	.9922	.00827		.00450			
50.....		.9880	.00698					
60.....	.005	.9832	.00591		.00349			

For 10 micron particles = 0.001 cm. dia. r = 0.0005 cm.
For 20 micron particles = .002 cm. dia. r = .0010 cm.
For 25 micron particles = .0025 cm. dia. r = .00125 cm.
For 30 micron particles = .003 cm. dia. r = .0015 cm.

100-mesh = 148 microns (μ)
200-mesh = 74 microns
325-mesh = 44 microns



Tube design for sedimentation test. Stop-cock may be used instead of cork shown

continued for approximately one minute. The pulp is allowed to settle for the desired calculated time; determined by formula (4); at the end of this time the siphon stop is opened and the suspended particles above the siphon tube are allowed to flow into a receiving beaker. The tube is again filled with liquid to the mark, agitated and allowed to settle. This procedure is continued until the liquid above the siphon tube is clear after the required settling time has elapsed. After siphoning off the liquid above the siphon on the last sedimentation test, the remaining liquid and sediment in the bottom of the tube is allowed to flow into a weighed porcelain dish. This settles clear and the major part of the liquid can be removed by decantation. The dish is then dried to constant weight. This gives the amount of material of particle size over or plus the micron size used in the formula for calculating time *(t)*. That under or minus is determined by difference or the siphoned-off material can be filtered and weighed. The time required for a determination of —25μ particle size, using h = 15 cm. t = 3 min. 26 sec. and requiring eight sedimentations for a clear liquid column above siphon is approximately 1 hr. 30 min. with an accuracy of plus or minus 1%. This includes also the time necessary to recover the alcohol used for the test.

In experimental work on this method of determining the quantity of "Flour in Cement," the height of column *(h)* from 10 to 30 cm. was used, and tests were made for —10, —25, and —45 microns. An example of calculating time *(t)* and some results are given:

$$t = \frac{9uh}{r^2 2g\ (s-d)} \qquad (4)$$

where:

t = time in sec.
u = viscosity of commercial alcohol C_2H_5OH in C.G.S. units = 0.0108 at 25 deg. C.
h = height of column used = 15 cm.
r = radius for 25 micron particles = 0.00125 cm.
g = acceleration due to gravity = 980 ($2g$ = 1960)
s = specific gravity of cement used = 3.12
d = specific gravity C_2H_5OH used = 0.808 at 25 deg. C.

and

$$t = \frac{9 \times .0108 \times 15}{.00125^2 \times 1960 \times (3.12 - .808)}$$

$$= \frac{\frac{1.4580}{}}{.000001562 \times 1960 \times 2.312}$$

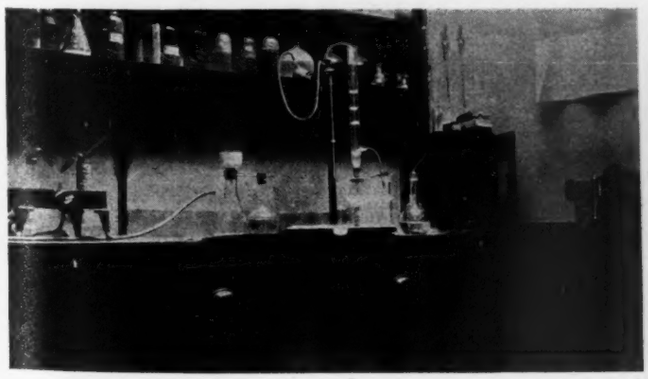
$$= \frac{1.4580}{.00708}$$

t = 206 seconds (= 3 min. + 26 sec.)

A practical sedimentation tube has been developed for the determination of the finer particles in cement and gypsum. The results obtained suggest that it might be well adopted in the laboratory for mill control work and that by checking against microscope determinations and standard samples a wider application might be possible.

TABLE II. TEST RESULTS WITH SEDIMENTATION APPARATUS

	Material		+25 μ	—25 μ	
1.	Fine ground high early strength p. cement		22.9	77.1	by diff.
2.	Fine ground high early strength p. cement	check.	23.3	76.7	by diff.
3.	Regular gray p. cement		55.3	44.7	by diff.
4.	Regular gray p. cement	check.	55.8	44.2	by diff.
5.	Fine ground high early p. cement		22.1	77.3	weighed
6	Calcined gypsum ground in Raymond low side mill		49.4	50.6	by diff.
7.	Calcined gypsum ground in Raymond low side mill	check.	49.7	49.6	weighed
8.	Calcined gypsum ground in Raymond kiln mill		21.0	79.0	
9.	Calcined gypsum ground in Raymond kiln mill	check.	22.5	76.8	weighed
10.	Regular gray p. cement		50.2	49.8	
11.	Regular gray p. cement	check.	50.8	48.3	weighed



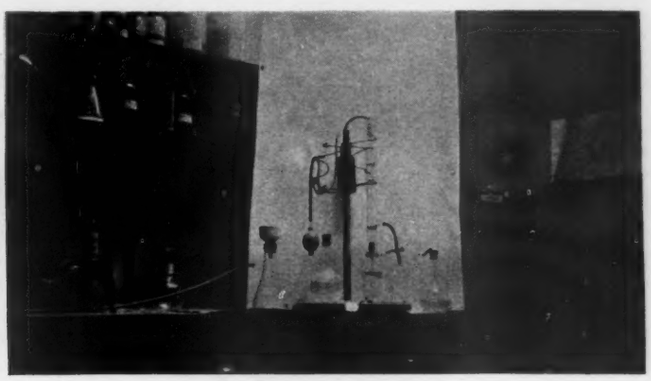


Figure 1 (left): Sedimentation tube. Figure 2 (right): Setup of apparatus for test

Hints and Helps for Superintendents

How We Solved the "Soft Stone" Problem

By Donald Shenk
Shenk Brothers, Durand, Mich.

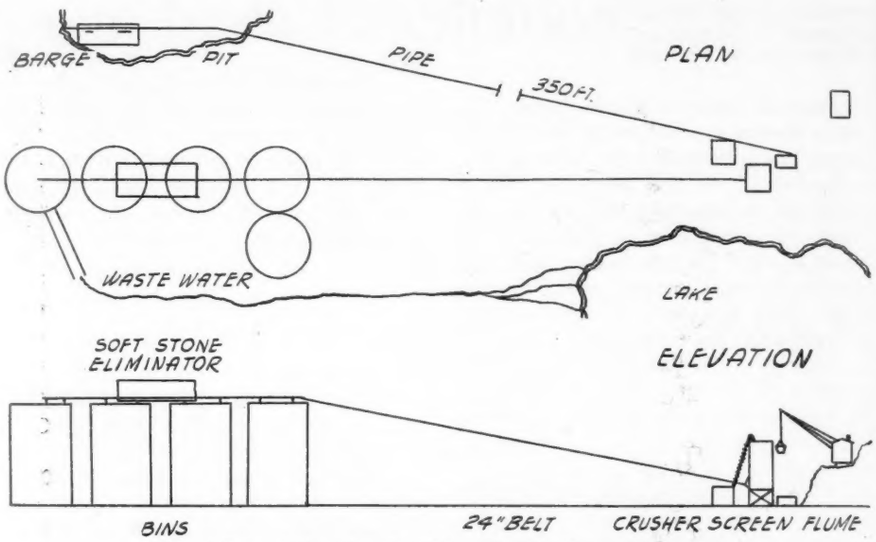
THE Federal Government is investing a lot of money—investing it, mind you, not giving it away. It wants its money's worth and the idea has caught on with state and county officials. So specifications are tightening up and one day the inspector on a big concrete road job comes in here, tramps over this property, runs some of our stuff through his fingers and says we have "too much soft stone. Cut it down. Specification allows not over 2%." He asked me how much ours ran and I guess "around 5½%" knowing that it runs nearer 9. An inspector always discounts a gravel man's story anyway. If I'd said 9% he'd have written me up in his little black book as having a deposit running 12% soft stone. That's the way they do.

Well, here I was with a couple of nice concrete road jobs on which I was to supply the gravel and the inspector sitting around grousing about the soft stone and not allowing me to deliver a handful.

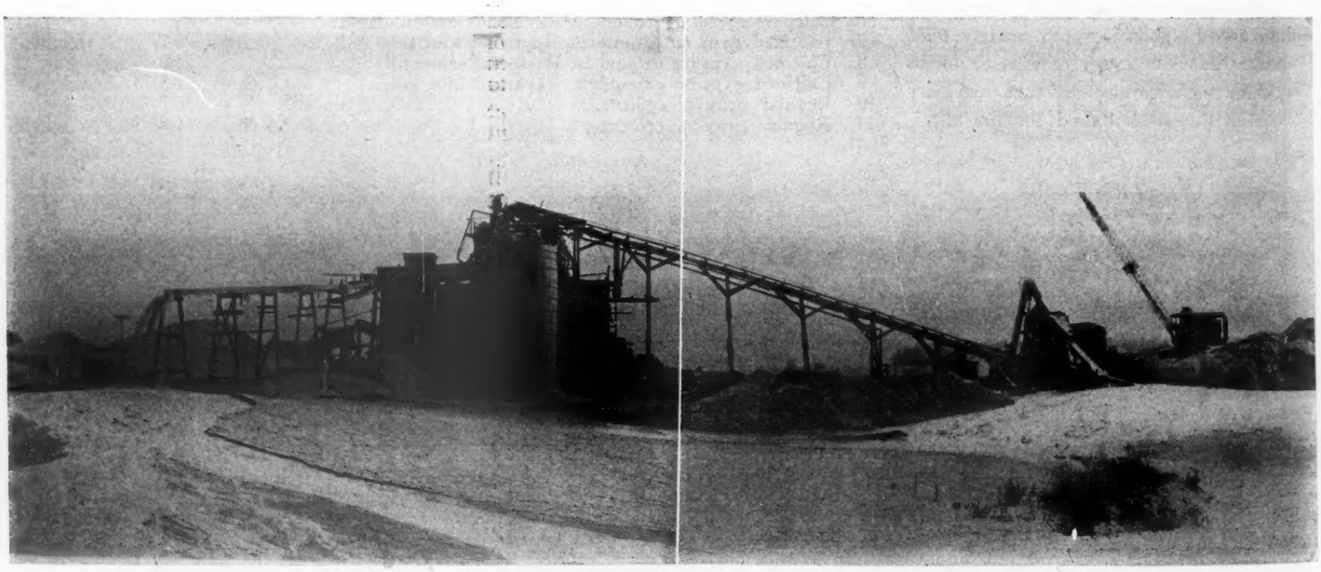
Let me go back. This deposit covers a considerable area 3½ miles from Durand. Under from 2 ft. to 8 ft. of overburden the gravel lies from 12 ft. to 35 ft. deep. We strip with a steam shovel, pump the gravel with an American Manganese pump driven by a 150-h.p. Westinghouse motor through a 10 in. to 8 in. pipe 350 ft. to a flume where the surplus water is removed.

From the flume the stuff goes to Simplicity vibrating screens. Rejections are fed to an Acme 16 in. crusher whose output is put back in the flow of material by a bucket elevator. A ¾-yd. Bay City crane picks up the sized material from the sump under the screens and deposits it on the belt conveyor. This 24-in. Goodyear belt carries the gravel up 42 ft. to another screen which gets rid of what little sand remains. Up to a month ago, the material was placed on a picking belt where seven or eight men stood all day picking out sandstone, ochre, a few sailers and a little shale. Not much of the latter two,—our chief trouble is sandstone and ochre.

Well, that's costly work and try as we would we still couldn't get a decent analysis on a product which is a sweet equality of gravel except for the soft stone. I haven't mentioned all the equipment we have—motor trucks so thick around here the traffic risk is terrible—but I've mentioned enough to show any gravel man what idleness means. With the state inspector sitting around with his eye on the gate we could just hear the



Plant layout showing location of soft stone eliminator



Main conveyor line on Shenk Brothers' property near Durand, Mich. Soft stone eliminator is mounted directly over bins

hoof-beats of the sheriff's trusty horse.

So we poked around and found a device that was said to eliminate the soft stone. Got it from the Knickerbocker Co., in Jackson, Mich. We mounted it at the discharge end of our main conveyer, on top of the bins, and the conveyor feeds into this new "soft stone eliminator." Just about all the soft stone is eliminated. Well, from a percentage of 9 we're down to a little over 1—1.6% to be exact. The specification allows 2%. We hooked the machine up so it discharges to the old picking belt but that isn't a picking belt any more. It's an inspection belt and instead of eight men standing there at 35c an hour we keep a couple of our own inspectors up there, just watching the flow. The six men taken off that job are working elsewhere in the pit, to better purpose. We're running 350 cu. yd. a day and as far as the soft stone eliminator is concerned it would handle double that much as we've tested it on long runs up to its rated capacity of 70 cu. yd. an hour.

The inspector's visits are chiefly social now. Every load of stuff that goes through our gate has the soft stone eliminated down to a maximum of 1.6%. So, while we're saving money on hand picking, the big point is that we wouldn't be able to sell our product at all on state concrete road work if we hadn't arranged to do the job mechanically. The eliminator is a sturdy brute—has a special alloy steel housing which encloses a squirrel cage rotor that sure powders the soft stone. The life of the machine is at least 50,000 tons of material. If we throw it away after that, its original cost, the cost of installation and of operation, will have been only a little over 5c a ton of material. And when I think of the difference in the price we get for specification gravel as against pit run gravel, that 5c processing cost looks almighty small.

Handling Aggregate

By Ross Wheelton
Hamilton, Ont., Canada

AN EFFICIENT layout for unloading and stocking concrete aggregate such as sand, gravel, crushed stone, etc., is shown in the accompanying illustration.

A concrete pit with a wooden hopper extends under the railway track; a belt conveyor carries the material from an adjustable gate in the bottom of the track hopper to a small steel hopper at the lower end of the longer conveyor belt. The material feeds from this small hopper on to the long belt, and is conveyed to the top where it is dropped into its respective bin. The long belt unit is pivoted at its lower end and the upper portion is carried by an A-frame mounted on wheels. These wheels run on a track made of steel plate screwed to short wooden ties laid in a circle.

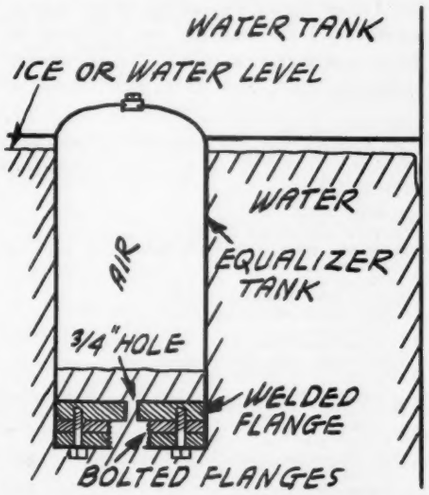
The long belt can thus be moved around almost a complete circle on the outer side of which are placed the bins. As few bins as needed can be erected at the start and others added as required; the space unoccupied by bins can be used for stock piling directly on the ground.

Speedy handling of aggregate materials

Equalizer to Prevent Tank Freezing

By Charles Labbe
Death Valley Junction, Calif.

TO prevent water tanks from freezing hard and damaging them, I have seen a simple device used to good advantage. It is made from a section of common kitchen hot water tank, the welded kind (not riveted); a flange is welded at the bottom with a ¾-in. hole in the center. Holes then are drilled in the flange to bolt on heavy pipe flanges as the tank must stand upright in the water and be balanced so that the upper part will be about one inch above the water level.



To eliminate water tank damage

At the first cold spell the whole surface of the water is frozen, and any colder weather will cause an expansion of the water. This will be taken up by the water compressing the air in the equalizer tank, the water going into the air chamber reduces the pressure. If any water is taken out of the tank the pressure is relieved and the equalizer is back to normal. If water is added, being warmer than the water in the tank the equalizer will rise above the ice.

At the upper part of the equalizer, the coldest, is air, the lower part being in water a few degrees warmer than the ice. In a cold spell this causes heat in the lower part water to follow the floating tank up to the ice to dissipate that heat, while at the same time a heavier pressure is forced upon the enclosed air. This heat in motion is sufficient to somewhat loosen the equalizer tank from the enclosing ice and permit some water to leak by and over the ice. The pressure being reduced, the tank is safe.

Welded Lip Saves Money

By Ernest Moyer
Alturas, Calif.

AT A PLANT which rests on a hardpan floor the gravel strata, 4 to 8 ft. deep, is so firmly cemented that if it were much more so it could not be excavated without blasting. This makes the operating problem more difficult than where a good, clean gravel is available.

To discharge the heavy sand the wet elevator is operated at 450 ft. per min. Ordinary buckets had a short life and to overcome this lips were welded on all buckets. Every fourth bucket had a saw-tooth lip as shown in the accompanying illustration, which has greatly improved the operation of this elevator and increased the length of life of the bucket. Even at this excessive speed the elevator has operated reliably and satisfactorily.

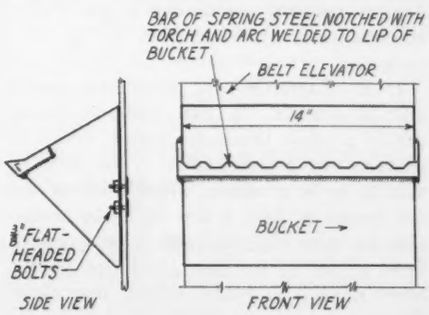


Diagram of bucket weld

Welding has been very useful about this plant and has made possible many economies. Another instance where we have used welding advantageously was on the plate feeder.

Rock Products News Briefs

Crushed Stone

Lehigh Stone Co., Kankakee, Ill., is meeting "gravel contractor" competition by bidding on road surfacing jobs. The Lehigh Stone Co. bid for surfacing six miles of secondary highway was $14,080.35, some $700 below the bid of a contractor who proposed to use a local gravel. According to the *Decatur* (Ill.) *Review:* "Opening of the Lehigh bid, which offered to ship crushed rock and spread it on the road at $1.59½ per cu. yd. caused owners of local gravel pits to declare the Lehigh company is offering to "give away" its product in order to break the hold on county road work by contractors who rely on local supplies of gravel. The Lehigh bid was 7½c per cu. yd. lower than the cost of local gravel, as shown in the gravel contractor's bid. While this was said to be the first time the Lehigh company has made a direct bid for a road contract in Macon county, two contractors bidding on the recently completed Maroa and Oreana-Warrensburg roads were prepared to use the company's product, but in that instance the Lehigh bids were approximately $2,700 above the bids of George Hackett, who received both contracts. At that time representatives of the Lehigh company warned the highway committee that a local gravel supply relied upon by Mr. Hackett would be exhausted before the Maroa road was completed. This warning proved accurate, and the job was delayed for weeks before Mr. Hackett finally secured gravel from the Lincoln Sand & Gravel Co. to complete the job."

◆ ◆ ◆

Dolomite Products Co., Rochester, N. Y., has established an affiliated concern, the Manitou Construction Co., to do highway contracting.

◆ ◆ ◆

R. Newton McDowell, Kansas City, Mo., is reported establishing a new quarry operation near Harvester, Mo.

◆ ◆ ◆

J. B. Easterlin, Jr., plantation owner near Montezuma, Ga., has announced discovery of a large limestone deposit, which he proposes to commercialize. The rock is said to be in a section which hitherto was not known to have a deposit, to be acceptable for state highways and to be accessible from a spur of the Central of Georgia Ry. Montezuma is in Macon county, near Oglethorpe.

◆ ◆ ◆

Michigan Limestone and Chemical Co., Calcite, Mich., is rather isolated. How the company provides for the amusement as well as the safety of its employes is told in an article by J. A. Valentin, safety and welfare director of the company, in *The Explosives Engineer.* "Safety picnics for the employes and their families and safety dinners for the men have been given. These have done much to stimulate and add zest to safety movements. Some work has been sponsored in the schools with the thought of creating the safety spirit in the children. The most popular activity is a safety poster contest where prizes are offered for the best poster conveying an original safety thought or slogan. Basketball, baseball, and tennis are the most popular forms of sport promoted. The plant has had eight competing basketball teams in their inter-departmental league. The schedule usually starts in early December and continues into March. The company has sponsored a garden program and this season there are 330 individual gardens in one plot."

◆ ◆ ◆

Kentucky: State supervised limestone pulverizers made 10,465 tons of agricultural limestone for farmers in nine counties in the first three operating months of this year. The average cost to farmers is claimed to be 24c per ton, exclusive of the cost of quarrying, which is usually done by the farmer.

◆ ◆ ◆

Crushed Stone Statistics for 1932

Complete returns from producers of crushed stone in 1932 have been compiled by the United States Bureau of Mines, and a summary of the findings are presented in the accompanying table. Total sales were 51,995,100 short tons of crushed stone, a decline of 28.4% from 1931. Truck shipments were relatively better maintained with the result that rail shipments amounted to only 31.8% of crushed-stone production, exclusive of railroad ballast.

Enough data are not immediately available to explain the exact cause of the drastic decline in rail shipments from 1931 to 1932. Apparently, however, activity in secondary road construction provided a stimulus for production of crushed stone by governmental units or by contractors operating for them. Virtually all this material was transported by truck. Data are now being compiled to indicate the quantity of material produced by non-commercial agencies. In 1931 this production amounted to a little more than 10% of the Bureau of Mines' total figure. An increase in the percentage for 1932 would explain the steep decline in rail shipments.

Adequate statistics on production by portable plants also would aid in clarifying the situation. Claims have been made that aggregates produced by portable outfits and shipped by truck actually increased from 1931 to 1932. If these claims are correct, it might be assumed that the entire decline in production was absorbed by the permanent or so-called "commercial plants," which, of course, would be reflected in a drastic decline in rail shipments. Additional data relating to the problem will be available in a few weeks, according to the Bureau of Mines.

SUMMARY OF SALIENT STATISTICS OF CRUSHED STONE SOLD OR USED BY PRODUCERS, 1931-1932

Kind of Stone	1931	1932*	Change from 1931, Per Cent
Concrete and Road Metal:			
Granite, quantity, short tons	5,223,550	3,033,890	—41.9
Value	$6,142,768	$3,031,162	—50.7
Value per ton	$1.18	$1.00	—15.3
Basalt and Related Rocks:			
Quantity, short tons	11,669,830	7,948,290	—31.9
Value	$12,792,313	$7,587,449	—40.7
Value per ton	$1.10	$0.95	—13.6
Limestone, quantity, short tons	42,121,430	32,612,550	—22.6
Value	$39,197,029	$28,650,198	—26.9
Value per ton	$0.93	$0.88	—5.4
Sandstone, quantity, short tons	2,355,340	1,518,120	—35.5
Value	$2,385,408	$1,692,935	—29.1
Value per ton	$1.01	$1.11	+9.9
Miscellaneous, quantity, short tons	4,441,370	2,907,710	—34.5
Value	$4,390,991	$2,690,030	—38.7
Value per ton	$0.99	$0.93	—6.1
Total, quantity, short tons	65,811,520	48,020,560	—27.0
Value	$64,908,509	$43,651,774	—32.7
Value per ton	$0.99	$0.91	—8.1
Railroad ballast:			
Granite, quantity, short tons	1,115,320	863,460	—22.6
Value	$966,664	$870,125	—9.9
Value per ton	$0.87	$1.01	+16.1
Basalt and related rocks:			
Quantity, short tons	552,610	433,060	—21.6
Value	$561,113	$440,377	—21.6
Value per ton	$1.02	$1.02	0.0
Limestone, quantity, short tons	4,480,470	2,450,970	—45.3
Value	$3,555,257	$1,748,412	—50.8
Value per ton	$0.79	$0.71	—10.1
Sandstone, quantity, short tons	249.220	81,300	—66.3
Value	$215,560	$75,782	—64.9
Value per ton	$0.86	$0.93	+8.1
Miscellaneous, quantity, short tons	415,270	145,750	—64.9
Value	$197,861	$105,295	—46.7
Value per ton	$0.47	$0.72	+53.2
Total, quantity, short tons	6,812.890	3,974,540	—41.7
Value	$5,496,455	$3,239,991	—41.1
Value per ton	$0.81	$0.82	+1.2
Grand total, quantity, short tons	72,624,410	51,995,100	—28.4
Value	$70,404.964	$46,891,765	—33.4
Value per ton	$0.97	$0.90	—7.2

*Final figures as compiled by A. T. Coons, Mineral Statistics Division.

Editorial Comments

Cooperation and Coordination Begin at Home

It is distressing to all who are earnestly working to give the "New Deal" a fair trial to find so many inconsistencies in the administration of the various recovery measures. While doing their best to put cooperation and coordination into practice in their respective industries, business men everywhere meet with glaring examples of the want of cooperation and coordination—even of understanding—on the part of government. All this is comprehensible and probably excusable; but it is deplorable because it is delaying progress and is confusing. By this time it should be possible to establish a few elemental principles of governmental policy. *If such have been established it is time to emphasize them.*

For example, business men have quite generally assumed that the *underlying principle* of the NRA is to raise prices to bring industry a profit so it can reëmploy idle men and thus restore purchasing power. But a digest of the speeches of the various apostles of the NRA leaves no assurance that the idea of profit in industry is an underlying principle at all.

The iron and steel industry, after acceptance by the NRA of a code that apparently assured prices with a margin of profit, was subjected to great pressure by the Federal Coordinator of Transportation to make a radical horizontal reduction in the price of rails to the railways. Worse than that, the Federal Coordinator of Transportation proposes to pool rail and other transportation equipment purchases, which would place steel and equipment manufacturers entirely at the mercy of their customers.

Aware of the importance of stimulating the capital goods industries the Government is developing various schemes to force Government funds into these industries in the form of loans, direct and indirect. This overlooks the real cause of the stagnation of the capital goods industries. The purchasers of capital goods need *capital, not loans.* There are but two sources of capital in industry—(1) accumulated profits or surplus; (2) long-term bonds, notes or participating shares, which can be sold only on the basis of anticipated profits. Moreover, there is no inducement to make capital investment unless some profit is being made or anticipated. The only source of capital under existing conditions is indeed the Government itself. It can raise capital by taxation or borrowing; as it can also lend it, or dissipate it, without much discrimination or sense of responsibility. If state capitalism really is the ultimate goal, it ought to be recognized now, and save a lot of beating around the bush. If there are to be *limited profits,* why not announce now what the limit is going to be, and allow industry an immediate opportunity to make that profit, if possible, and find its own capital?

Again, we have the Federal Administrator of Public Works urging—even forcing—the spending of billions of dollars to provide employment, while his fellow Federal Emergency Relief Administrator is urging the various State Governments to divert their gasoline and motor-vehicle tax money for poor relief. On the one hand, Federal money for many hastily conceived and questionable construction enterprises; on the other, robbing funds raised by taxation for the specific and well-planned purpose of building and improving highways, in many cases contrary to state laws—on the one hand, attempting to create employment; on the other, actually causing unemployment.

In Illinois, the state government has used nearly $79,000,000 of Federal money for relief of unemployment—about one-sixth of the total Federal relief funds expended in all 48 states—while highway construction, for which the state has a current income of 30 to 40 million, has been reduced to nothing, because the governor has been afraid the cement companies might make a profit—the state government promoting unemployment, the Federal Government relieving with doles these same unemployed at the expense of taxpayers in other states—both state and national governments responsible for conditions that make it impossible for industry to care for its own unemployment.

And yet again, we have the National Recovery Administrator proclaiming: "In this new era of mass production and chain distribution there is little room in commerce and industry for the adventurer on a shoe string. All the common callings have merged into mass enterprise. The anvil and the bellows of the village blacksmith have given place to the enormous productivity of batteries of drop forges and rows of open hearths." Etc., etc. Yet one of his deputy administrators sees no parallel in "the adventurer on a shoe string" and the portable sand and gravel plant operator, who, operating in a territory amply provided for by a permanent industry, is destroying both capital investment and means of employment.

The United States Army Engineer Department has been awarded millions of the public works funds designed "to prime American capital goods industries," in the language of high government officials. In Honolulu the army engineers are spending some of this money for Japanese cement "because it is sold cheaper than the American product." Indeed it is sold cheaper than it costs to make American cement!

These things illustrate a common fallacy of many government officials: that the cheapest product is necessarily the most economical. The *most economical product* is the one which fits best into the economy of things as a whole; it may cost more at the point of delivery, but if it has contributed to the maintenance of an established industry, or industries, and has paid its way all along the line, its producers have rendered a more important economic service than perhaps those of the cheaper product—certainly so if the producers of the cheaper product have paid no taxes, offered no opportunities for permanent employment, nor made any other contribution to the public welfare.

Recent Quotations on Rock Products Securities

Stock	Date	Bid	Asked	Dividend
Allentown P. C., com.[47]	10-21-33	3	5	
Allentown P. C., pfd.[47]	10-21-33	6	8	
Alpha P. C., com.	10-20-33	13¼	14¼	
Alpha P. C., pfd.	10-21-33	60	....	50c qu. Sept. 15, '33
Amalgamated Phos. 6's, '36[47]	10-21-33	95	98	
American Aggregates, com.[47]	10-21-33	1	2	
American Aggregates, pfd.[47]	10-21-33	10	15	
American Aggregates 6's w.w.[47]	10-21-33	25	30	
American Aggregates 6's ex-w.[47]	10-21-33	20	28	
Amer. L. & S. 1st 7's[47]	10-21-33	50	55	
Arundel Corp., com.[47]	10-21-33	21	24	50c qu. Oct. 2, '33
Bessemer L. & C. Class A[47]	10-21-33	3	5	
Bessemer L. & C. 1st 6½'s[47]	10-21-33	15	17	
Bessemer L. & C. cert. of dep.[47]	10-21-33	15	17	
Bloomington Limestone 6's[47]	10-21-33	6	9	
Boston S. & G. new com.[37]	10-13-33	1	....	
Boston S. & G. new 7%, pfd.[37]	10-13-33	5	....	1.75 qu. Jan. 3, '33
Boston S. & G. 7's, 1934[10]	10-13-33	40	....	
California Art Tile, A[9]	10-15-33	1	2	
California Art Tile, B[9]	10-14-33	....	½	
Calaveras Cement, com.	10-17-33	2¼	4⅝	
Calaveras Cement 7%, pfd[40]	10-13-33	40	50	1.75 qu. Oct. 15, '33
Canada Cement, com.	10-19-33	5½	6	
Canada Cement, pfd.	10-19-33	....	28	
Canada Cement 5½'s, 1947	10-17-33	74	75	
Canada Crushed Stone bonds[42]	10-13-33	62	66	
Canada Crushed Stone, com.[42]	10-13-33	2½	....	
Certainteed Products, com.	10-21-33	2⅝	2¾	
Certainteed Products, pfd.	10-21-33	12	22	
Certainteed Products 5½'s, 1948	10-19-33	45¼	actual sale	
Cleveland Quarries	10-20-33	....	24	
Consol. Cement 1st 6½'s, A[47]	10-21-33	8	11	
Consol. Cement, pfd.[47]	10-21-33	1	2	
Consolidated Oka Sand and Gravel (Canada) 6½'s[12]	10-13-33	....	20	
Consolidated Oka Sand and Gravel (Canada), pfd[12]	10-13-33	No market		
Consol. Rock Prod., com.[47]	10-21-33	½	1	
Consol. Rock Prod., pfd.[47]	10-21-33	1	2	
Consol. Rock Products units[47]	10-21-33	2	3	
Consol. S. & G., pfd. (Can.)[32]	10-13-33	No market		
Construction Mat., com.[47]	10-21-33	1	2	
Construction Mat., pfd.[47]	10-21-33	2½	4	
Consumers Rock and Gravel, 1st Mtg. 6's, 1948[47]	10-21-33	40	45	
Coosa P. C. 1st 6's[47]	10-21-33	15	20	
Coplay Cem. Mfg., pfd.[47]	10-21-33	6	8	
Coplay Cem. Mfg. 6's, 1941[47]	10-21-33	35	40	
Dewey P. C., com.[47]	10-21-33	70	90	
Dolese and Shepard	10-23-33	9	10	
Dufferin Pav. & Cr. Stone, com.	10-19-33	1	2¼	
Dufferin Pav. & Cr. Stone, pfd.	10-19-33	28	....	
Edison P. C., com.[47]	10-21-33	2	4	
Edison P. C., pfd.[47]	10-21-33	4	6	
Federal P. C. 6½'s, 1941[47]	10-21-33	35	38	
Giant P. C., com.[47]	10-21-33	2	4	
Giant P. C., pfd.[47]	10-21-33	10	15	
Gyp. Lime & Alabastine, Ltd.	10-19-33	3	3½	
Gyp. Lime & Alabastine 5½'s, 1948	10-17-33	48	50	
Hermitage Cement, com.[47]	10-21-33	10	15	
Hermitage Cement, pfd.[47]	10-21-33	40	50	
Ideal Cement 5's, 1943[47]	10-21-33	94	97	
Ideal Cement, com.	10-20-33	24	29	25c qu. Oct. 1, '33
Indiana Limestone 6's[47]	10-21-33	15	20	
International Cem. com.	10-20-33	24½	26½	
International Cem. bonds, 5's	10-21-33	75	actual sale	Semi-ann. int.
Kelley Island L. & T.	10-20-33	8½	12	25c qu. Jan. 2, '33
Ky. Cons. Stone, 6½'s, 1933	10-20-33	5	6	
Ky. Cons. Stone, com.[47]	10-21-33	....	1	
Kentucky Cons. Stone, pfd.	9-23-33	....	10	
Ky. Cons. Stone, 7% pfd.[47]	10-21-33	....	5	
Ky. Cons. Stone 1st Mtg. 6½'s[46]	10-24-33	5	....	
Ky. Cons. St. V. T. C.[47]	10-21-33	....	½	
Ky. Rock Asphalt, com.	10-20-33	....	2	
Ky. Rock Asphalt, pfd.	10-20-33	10	....	
Ky. Rock Asphalt 6½'s, 1935	10-20-33	53	55	
Kentucky Stone, com.	8-19-33	....	¼	
Kentucky Stone, pfd.	8-19-33	....	10	
Lawrence P. C.	10-21-33	10½	15	
Lawrence P. C. 5½'s, 1942[47]	10-21-33	55	60	
Lehigh P. C., com.	10-20-33	10½	11	
Lehigh P. C., pfd.	10-21-33	76½	93	87½c qu. Oct. 1, '33
Louisville Cement[47]	10-21-33	70	80	
Lyman-Richey 1st 6's, 1935[47]	10-21-33	80	85	
Marbelite Corp., com (cement products)	7-15-33	5c	½	
Marbelite Corp., pfd.	7-15-33	¼	....	
Marquette Cement, com.[47]	10-21-33	7½	8½	
Marquette Cement, pfd.[47]	10-21-33	50	54	1.50 qu. Jan. 3, '33
Marquette Cem. Mfg. 1st 5's, 1936[47]	10-21-33	65	70	
Marquette Cem. Mfg. 1st 6's, 1936[46]	10-24-33	65	(nominal)	
Material Service Corp.[47]	10-21-33	5	7	
McCrady-Rodgers, com.[47]	10-21-33	7	10	
McCrady-Rodgers 7%, pfd.[47]	10-21-33	35	40	
Medusa P. C., com.[47]	10-21-33	10	14	
Medusa P. C., pfd.[47]	10-21-33	30	35	
Michigan L. & C., com.[47]	10-21-33	50	50	
Missouri P. C.[47]	10-21-33	7	7½	
Monarch Cement, com.[47]	10-21-33	40	50	
Monolith P. C., com.[47]	10-21-33	2	3	
Monolith P. C., pfd.[47]	10-21-33	5	6	25c qu. Sept. 28, '33
Monolith P. C., units[47]	10-21-33	6	8	
Monolith P. C. 1st Mtg. 6's[47]	10-21-33	79	82	
Monolith Portland, Midwest[47]	10-21-33	½	1	
National Cem. (Can.) 1st 7's[12]	10-13-33	No market		
National Gypsum A, com.	10-23-33	6	6¾	
National Gypsum, pfd.	10-23-33	67	70	1.75 qu. Oct. 1, '33
National Gypsum 6's[47]	10-21-33	80	83	
National L. & S. 6½'s, 1941[47]	10-21-33	65	70	
Nazareth Cement, com.[47]	10-21-33	3	5	
Nazareth Cement, pfd.[47]	10-21-33	30	35	
Newaygo P. C. 1st 6½'s[47]	10-21-33	40	45	
New England Lime 6's, 1935[14]	10-11-33	6	....	
N. Y. Trap Rock 1st 6's, 1946	10-21-33	52¼	actual sale	
N. Y. Trap Rock 7%, pfd.[47]	10-21-33	65	70	1.75 qu. Jan. 3, '33
North Amer. Cem. 1st 6½'s[47]	10-21-33	20	25	
North Amer. Cem., com.[47]	10-21-33	1	2	
North Amer. Cem. 7%, pfd.[47]	10-21-33	2	3	
North Shore Mat. 1st 6's[47]	10-21-33	40	45	
Northwestern States P. C.[47]	10-23-33	35	37	
Northwestern Port. Cem. Units.	9-23-33	30	35	
Ohio River S. & G., com.[47]	10-21-33	1	2	
Ohio River S. & G. 1st, pfd.[47]	10-21-33	5	10	
Ohio River S. & G. 2d, pfd.[47]	10-21-33	2	4	
Ohio River S. & G. 6's[47]	10-21-33	8	12	
Oregon P. C., com.[47]	10-21-33	12	15	
Oregon P. C., pfd.[47]	10-21-33	65	70	
Pacific Coast Aggr., com.[40]	10-13-33	10c	....	
Pacific Coast Aggr. pfd.[40]	10-13-33	20c	....	
Pacific Coast Aggr. 6½'s, 1944[6]	10-13-33	15	17	
Pacific Coast Aggr. 7's, 1939[6]	10-13-33	1	3	
Pacific Coast Cement 6's, 1937[47]	10-21-33	45	47	
Pacific P. C., com[40]	10-13-33	5	6½	
Pacific P. C., pfd[40]	10-13-33	31	36	
Pacific P. C. 6's, 1935[47]	10-21-33	88	91	
Pacific Portland Cement 6½'s, pfd.[5]	10-15-33	32½	....	1.62½ qu. Jan. 5, '33
Peerless Cement, com.[47]	10-21-33	¼	¾	
Peerless Cement, pfd.[47]	10-21-33	2	4	
Penn.-Dixie Cement, com.	10-20-33	3½	4	
Penn.-Dixie Cement, pfd.	10-21-33	10	16⅝	
Penn.-Dixie Cement 6's, A	10-19-33	57½	actual sale	
Penn. Glass Sand Corp., pfd.[47]	10-21-33	68	75	1.75 qu. Oct. 2, '33
Penn. Glass Sand Corp. 6's[47]	10-21-33	93	97	
Petoskey P. C., com[46]	10-24-33	1¼	....	
Petoskey P. C. 6's, 1941[46]	10-24-33	40	....	
Petoskey P. C. 6's, 1937	10-17-33	39	44	
Phosphate Mining Co. (N. Y.) com.	9-23-33	No market		
Port Stockton Cem., com.[9]	10-14-33	No market		
Republic P. C. 6's, 1943[47]	10-21-33	63	66	
Riverside Cement, A[47]	10-21-33	4	6	
Riverside Cement, B[47]	10-21-33	1	2	
Riverside Cement, pfd.[47]	10-21-33	70	75	1.50 qu. Aug. 1, '33
Rockland and Rockport Lime, 1st, pfd.	10-21-33	1	2	
Sandusky Cement 6's[47]	10-21-33	30	35	
Sandusky Cement 6½'s, 1932-37[47]	10-21-33	35	40	
Santa Cruz P. C., com.[47]	10-21-33	55	60	1.00 qu. Oct. 2, '33
Schumacher Wallboard, com.[47]	10-21-33	1	2	
Schumacher Wallboard, pfd.[47]	10-21-33	3	5	
Signal Mt. P. C., units[47]	10-21-33	10	15	
Southwestern P. C. units[47]	10-21-33	170	200	
Southwestern P. C., com.[47]	10-21-33	30	40	1.00 qu. Oct. 2, '33
Southwestern P. C., pfd.[47]	10-21-33	80	100	2.00 qu. Oct. 2, '33
Standard Paving & Mat. (Canada), com.[47]	10-21-33	2	4	
Standard Paving & Mat., pfd.[47]	9-23-33	40	45	
Superior P. C., A[47]	10-21-33	20	25	27½c mo. May 1, '33
Superior P. C., B[47]	10-21-33	5	7	
Trinity P. C. units[47]	10-21-33	26	30	
Trinity P. C., com.[47]	10-21-33	5	10	
Trinity P. C., pfd.[47]	10-21-33	22	26	
U. S. Gypsum, com.	10-21-33	42½	43	25c qu. Oct. 2, '33
U. S. Gypsum, pfd.	10-21-33	103	117¾	1.75 qu. Oct. 2, '33
Wabash P. C.[47]	10-21-33	4	6	
Warner Co., com[47]	10-21-33	3	5	
Warner Co. 1st 7%, pfd.[47]	10-21-33	17	20	
Warner Co. 6's, 1944, w.w.[47]	10-21-33	30	40	
Warner Co. 6's, 1944, ex-w.[47]	10-13-33	18½	35	
Whitehall Cem. Mfg., com.[47]	10-21-33	15	20	
Whitehall Cem. Mfg., pfd.[47]	10-21-33	35	45	
Wiscon. L. & C. 1st 6's, '33[47]	10-21-33	70	90	
Wiscon. L. & C. 6½'s[47]	10-21-33	70	90	
Wolverine P. C., com.[47]	10-21-33	1½	2½	
Yosemite P. C., A, com.[47]	10-21-33	2	4	

Quotations by: [8]Smith, Camp & Riley, San Francisco, Calif. [9]A. E. White Co., San Francisco, Calif. [12]James Richardson & Sons, Ltd., Winnipeg, Man. [14]First Wisconsin Co., Milwaukee, Wis. [37]Wise, Hobbs & Arnold, Boston. [40]Martin Judge, Jr., and Co., San Francisco, Calif. [42]Nesbitt, Thompson & Co., Toronto. [46]First Union Trust & Savings Bank, Chicago, Ill. [47]Anderson Plotz and Co., Chicago, Ill.

Recent Dividends Announced

Ideal Cement Co. (qu.)	$0.25	Oct. 1
Penn. Glass Sand Corp. pfd. (qu.)	1.75	Oct. 2
Santa Cruz Portland Cement Co., com. (qu.)	1.00	Oct. 2
Southwestern Port. Cement com. (qu.)	1.00	Oct. 2
Southwestern Port. Cement pfd. (qu.)	2.00	Oct. 2

Alpha Portland Cement Co., Easton, Penn., reports earnings for the 12 months ended September 30:

	1933	1932.
Net sales	$3,960,870	$4,210,575
Operating expenses	3,592,176	4,543,294
Depreciation	1,415,088	1,398,048
Operating loss	$1,046,394	$1,730,767
Other income (net)	65,454	284,542
Total loss	$ 980,940	$1,446,225
Federal taxes	.....	.....
Minority interests	Cr9,455	Cr13,940
Net loss	$ 971,485	$1,432,285
Preferred dividends	140,000	140,000
Common dividends	.....	355,500
Deficit	$1,111,485	$1,927,785
Earnings per share on 711,000 shares common stock (no par)	Nil	Nil

The balance sheet as of September 30 as compared with that of a year ago shows property account assets written down from $19,108,793 to $17,803,915; cash assets from $2,772,220 to $2,010,864; but value of marketable securities increased from $2,696,793 to $3,850,949. Surplus was reduced from $5,948,459 to $4,972,310.

American Silica-Sand Co., Ottawa, Ill., reports a balance sheet, as of December 31, 1932:

Fixed assets	$ 989,889
Current assets:	
Cash	936
Accounts receivable	7,531
Inventory	214
Investment in American Silica Refining Co.	250,000
Other assets	25,461
Deferred charges	1,925
Total	$1,275,957
Liabilities:	
Common stock	$ 97,500
Income 6s, 1951	966,500
Purchasing money obligations	.....
Mortgage notes	61,040
Current liabilities:	
Notes payable	5,203
Accounts payable	5,229
Accruals	5,608
Paid-in surplus	175,095
Operating loss	40,220
Total	$1,275,957
Current assets	$ 8,682
Current liabilities	16,041
Working capital	(d) 7,359

North American Cement Corp., New York City, has elected to its board of directors the following additional directors: Leo M. Blancke and Ridley Watts of New York City; W. L. L. Peltz, Albany, and J. B. Ferguson, Hagerstown, Md. Mr. Blancke is chairman of the Debentureholders' Protective Committee and Mr. Watts is chairman of the Preferred and Common Stockholders' Protective Committee. Recently the corporation announced that the new securities issuable under the plan for the readjustment of its capital structure, as declared operative, were now ready for delivery and that the September 1, 1933, coupon, attached to the new 6½% mortgage bonds, due 1943, was being paid by the trustee.

Federal Portland Cement Co., Buffalo, N. Y.; on November 6 holders of first mortgage 6½% bonds due in 1941, are to consider waiving for a period not exceeding three years, default in payment of interest due September 1, 1933, and any or all defaults which may or shall accrue during such period or periods, by reason of nonpayment of interest or of sinking fund installments, or of any extension of time of payment of such interest or sinking fund installments; also, extending for a period not exceeding three years, time of payment of interest due September 1, 1933, and of all other interest becoming due and payable during such period or periods of extension, and by extending time of payment of all sinking fund installments which may become due during such period. Bondholders will also consider modification of the trust deed in order that the company may procure sufficient working capital to resume and continue operations, and to assent to any arrangement or agreement with any creditor.

Pennsylvania-Dixie Cement Corp., New York City, reports consolidated earnings for the 12 months ending September 30:

	1933.	1932.
Operating profit	$ 315,935	$ 329,453
Depreciation and depletion	1,379,578	1,380,844
Loss	1,063,643	1,051,391
Interest	578,584	598,473
Net loss	1,642,227	1,649,864

The balance sheet as of September 30 shows property account assets written down from a year ago, $22,290,600 to $20,970,690; cash from $2,443,183 to $1,461,195. Total assets were reduced from $27,481,800 to $25,786,056; but surplus was increased from $263,583 to $2,835,430. Current assets were $4,700,644 against $5,110,344 in 1932.

American Lime and Stone Co. Bonds

A. D. WARNER, JR., vice-president of the American Lime and Stone Co., Bellefonte, Pa., under date of September 1, 1933, has informed holders of the company's first mortgage sinking fund 7% bonds, due 1942, that: "As of this date the trustee has in hand for the account of the sinking fund cash totaling some $22,000, but has declined to use this fund for the acquisition of bonds for the sinking fund, taking the position that it will not operate the sinking fund on cash received from one source when the amount due from another source remains unpaid.

"Preliminary figures for the current year to August 1, indicate that earnings have been sufficient to cover interest and depreciation charges. As of August 1, the current financial position of the company is satisfactory.

"The arrearage in the sinking fund continues to increase at the rate of $7,300 per month, indicating a future problem for the solution of which the cooperation of the bondholders will be required. The indenture under which the bonds are issued does not contain a provision providing for its modification, so that it would seem impossible to make an adjustment of the sinking fund provisions through modification of the indenture. Temporarily the company is in a position to pay part of the monthly sinking fund amounting to $7,000, but this would avail nothing inasmuch as the trustee will make no move until the entire arrearage has been corrected. To make full payment might jeopardize the present healthy condition of the company's working capital and menace its ability to continue the payment of interest."

New York Trap Rock Co.

CONSOLIDATED income account of the New York Trap Rock Co., New York City, for the years ended December 31 are reported as follows:

	1932	1931
Gross profit	not stated	$2,552,303
Administrative, selling and general expenses.	.....	452,834
Operating profit	$860,949	2,099,470
Depreciation	519,464	523,019
Depletion	12,864	24,713
Balance	328,621	1,551,738
Other income	.....	64,199
Total income	328,621	1,615,937
Funded debt interest	339,743	367,333
Other interest, etc.	32,978	62,308
Federal taxes, etc.	81,197	215,287
Reserve for bad debts	66,406	31,499
Minority interest	(cr)753	(dr)7,541
Net income	(d)190,951	931,969
Preferred dividends	72,520	105,567
Surplus for year	(d)263,471	826,402

The company has paid no preferred dividends since January 3, 1933 ($1.75); and no common stock dividends since December 26, 1929 ($3). Earnings per common share have been 1928, $8.11; 1929, $10.29; 1930, $8.22; 1931, $4.60; 1932, a deficit of $1.46.

CONSOLIDATED BALANCE SHEET OF NEW YORK TRAP ROCK CO.
(As of December 31)

Assets:	††1932	1931
Property and plants	$19,672,123	$19,450,012
Repair parts and supplies	356,597	.....
Sinking fund cash	45,782	.....
Miscellaneous investments (cost)	44,117	.....
Current assets:		
Cash	307,830	*1,029,550
Marketable securities	†3,433	76,549
Accounts and notes receivable (net)	1,054,172	1,624,089
Inventories (cost)	332,915	703,785
Special deposits, etc.	223,933	209,783
‡Reacquired preferred stock	1,006,550	768,550
Deferred charges	43,805	27,714
Total	$23,091,258	$23,890,031
Liabilities:		
§Preferred stock	$2,000,000	$2,000,000
§Common stock	5,875,925	5,875,925
Minority interest	34,095	104,761
First 6s, 1946	4,824,500	5,179,500
Debenture 7s, 1936	508,000	631,000
Current liabilities:		
Reserve for taxes	28,747	135,081
Notes payable	381,585	
Accounts payable etc.	278,194	692,185
Reserve for compensation insurance	146,987	151,391
Reserve for depreciation and depletion	3,118,119	2,542,877
**Capital surplus	1,020,336	322,836
Earned surplus	4,874,771	6,254,475
Total	$23,091,258	$23,890,031
Current assets	$1,698,350	$3,433,972
Current liabilities	¶688,525	827,266
Working capital	1,009,825	2,606,706

*Including $7,668 in closed bank. †At cost. ‡At cost: 1932, 10,990 shares; 1931, 8,090. §Represented by 20,000 $7 preferred and 180,000 common no par shares. ¶Excludes sinking fund requirements. Company is obligated to make payments totaling $375,000 in 1933 for sinking fund requirements. **Appreciation of property taken into accounts in 1918, less capital adjustments. ††Includes assets and liabilities of Kohl Realty & Development Corp. and Core Joint Concrete Pipe Corp.

TRAFFIC and TRANSPORTATION

Proposed Rate Changes

THE FOLLOWING are the latest proposed changes in freight rates up to and including the week ending October 14:

New England

31100. **Crude or ground feldspar, flint, rock and quartz rock,** minimum weight 50,000 lb., to Olean, N. Y., from Burleyville, Mathews, Ossipee, Rumney and Swainboro, N. H., 24; Cardigan, Cold River, Grafton, Keene, South Lyndeboro, N. H., 22½. Present, B. & M. R. R., I. C. C. A-2570.

Trunk Line

31426. To revise the commodity description in agency and individual carriers tariff naming rates on **limestone, ground or pulverized,** also **agricultural limestone,** to read as follows: Limestone, ground or pulverized, or limestone dust, unburnt, in box cars; limestone, agricultural, unburnt, in box cars, for application within Trunk Line territory and from Trunk Line to C. F. A. and N. E. F. A. territories.

31431. **Sand,** in open top cars, without tarpaulin or other protective covering, C. L. (See Note 3), from Mapleton District, Pa., to Kaylor and Dewey, Pa., $1.80 per net ton. Present rate, $2.75 per net ton.

31332. **Limestone, crude, fluxing, foundry or furnace, carload,** minimum weight, when loaded in container car 110,000 lbs.; when loaded in open top equipment (See Note 3) from Martinsburg, W. Va., to Erie, Pa., $2.10 per gross ton.

31434. (a) **Limestone** (finely ground), carload, minimum weight 50,000 lbs., and (b) **chemical and land lime,** carload, minimum weight 30,000 lbs., from Annville, Palmyra and Swatara, Pa., to Englishtown and Runyon, N. J., (a) 13c, and (b) 14c per 100 lbs.

31446. **Stone chips or granules (roofing granules),** C. L., min. wt. 50,000 lbs., from Advance, Gladhill and Maria Furnace, Pa., to Fulton, N. Y., $3.28 per net ton. (Present rate $3.78 per net ton.)

31448. (A) **Crushed stone, uncoated,** C. L.; (B) **Crushed stone, coated with oil, tar or asphaltum,** C. L. (The oil, tar or asphaltum not to exceed 10% by weight of the commodity shipped), (See Note 2), Bethlehem, Pa., to Williamsport, Pa., (A) $1.50, and (B) $1.63 per net ton.

M-3255. It is proposed that rates on **limestone, ground or pulverized and limestone dust,** C. L., from Watertown, N. Y., to N. Y. C. R. R. stations Thompsons to Wentz, N. Y., incl., be placed on basis of the Bellfonte scale plus 10c per net ton, subject to min. wt. of 60,000 lb., and also that the same basis be applied from Jamesville, N. Y., to same points.

31355. **Sand blast, engine, foundry, moulding, glass, silica, quartz or silex,** C. L., (See Note 2), from Hancock and Round Top, Md., to Carlisle, Pa., $1.80 per net ton.

31436. **Stone chips or granules (roofing granules),** C. L., minimum weight 50,000 lb., from Cockeysville and Texas, Md., to Fulton, N. Y., $3.28 per net ton.

31465. **Limestone, unburnt, ground or pulverized,** C. L., (See Note 2), from Toms Brook, Va., to Covington, Va., $1.55 per net ton. Present rate $2.35 per net ton (combination).

31466. **Crushed stone, natural,** C. L., (See Note 2), from Bound Brook, N. J., to Point Pleasant, N. J., 90c per net ton. Present rate $1.27 per net ton.

31481. **Lime, common, hydrated, quick or slacked, viz., building, land or chemical,** C. L., minimum weight 30,000 lb., from Binnewater, N. Y., to destinations on the N. Y. O. & W. Ry., Middletown, Luzon, Liberty, East Branch, Keerys, Northfield, N. Y., and various. Rates ranging from 10c to 17½c per 100 lb.

31446. **Stone chips or granules** (roofing granules), C. L., minimum weight 50,000 lb., from Easton (13th St.), Pa., to Fulton, N. Y., $3.28 per net ton.

31431. **Sand,** in open top cars, without tarpaulin or other protective covering, C. L., (See Note 2), from Hancock-Berkeley Springs district to Kaylor and Dewey, Pa., $1.90 per net ton.

31461. (A) **Stone, natural, crushed or broken, uncoated,** C. L. (B) **Stone, natural, crushed or broken, coated with oil, tar or asphaltum,** C. L. (See note), minimum weight 90% of marked capacity of car, from Oriskany Falls, N. Y., to N. Y. C. R. R. stations.

Note—The oil, tar and/or asphaltum, not to exceed 10% by weight of the commodity as shipped, the shipper to so certify on shipping orders and bills of lading.

Stations.	Proposed rates (A)	(B)
Saranac Lake	160	173
Gabriels	160	173
Rainbow	160	173
Onchiota	160	173
Lake Kushaqua	160	173
Morgan	160	173
Loon Lake	160	173
Plumadore	160	173
Mountainview	160	173
Owls Head	160	173
Chasm Falls	170	183
Whippleville	170	183
Malone	170	183
Constable	170	183
Spring Cove	160	173
Santa Clara	160	173
St. Regis Falls	160	173
Dickinson Centre	160	173
Moira	170	183
Ironton	170	183
Helena	170	183
Nyando	170	183

31431. **Sand,** in open top cars, without tarpaulin or other protective covering, C. L., (See Note 2), to Kaylor and Dewey, Pa., from Hancock and Round Top, Md., $1.90, and from Cumberland, Md., $1.80 per ton net.

31503. (A) **Building lime,** C. L., and (B) **agricultural, land, chemical, gas and glass lime,** C. L., minimum weight 30,000 lb., from York, Union Stone Co., Billmyer, Campbell, Hellem and Wrightsville, Pa., to Beaver Springs, Pa. (A) 10c per 100 lb. and (B) 9c per 100 lb. Reason—Proposed rates are comparable with rates from York, Pa., to Milroy, Milton and Petersburg, Pa.

31520. **Crushed stone,** C. L., (See Note 2), from York, Pa., and Campbell, Pa., to Cedarville, Woodville, Gallant Green, Hughesville, Oaks, Charlotte Hall, New Market, Mechanicsville, Jarboes, Forrest Hall and Brandywine, Md., $1.75 per net ton.

Central

37231. To establish on **lime, agricultural,** C. L., minimum weight 30,000 lb., to Strongsville, O., from Genoa, Martin and Marblehead, O., rate of 8c. Present—From Genoa and Martin, O., rate of 15c; from Marblehead, O., rate of 13c (Official Classification basis).

37310. To establish on **crushed stone and agricultural limestone,** in open top cars, C. L., from McVittys to Robertsville, O., rate of 125c per net ton (gross rate). Emergency charge not to be applied. Route: Via C. C. C. & St. L. Ry., Forest, O., P. R. R., Canton, O., W. & L. E. Ry. Present, 125c ($1.25 published to Sherrodsville, O., in C. C. C. & St. L. Ry., Tariff 1949, and applicable to Robertville, under the intermediate rule in tariffs).

37311. To establish on **crushed stone and agricultural limestone,** in open top cars, C. L., from McVittys, O., to Alvordton, O., rate of 115c per net ton (gross rate). Emergency charge not to be applied. Present rate, sixth class per C. F. A. L. Tariff 481. Route: Via C. C. C. & St. L. Ry., Forest, O., P. R. R., VanWert, O., Cin. Nor. R. R.

37401. To establish on **stone, crushed** (in bulk), **limestone, agricultural** (not ground or pulverized) (in bulk in open top cars), and **limestone,** unburned, agricultural (in bulk in open top cars), C. L., from Spore, O., to Buffalo Creek, W. Va., rate of 190c per N. T.

37427. To establish on **stone, crushed** (in bulk in open top cars), and crushed stone screenings (in bulk in open top cars), C. L., from Ashtabula and Ashtabula Harbor, Ohio.

To	Proposed
Simons, O.	60c N. T.
Osgood, Pa.	70c N. T.
Amasa, Pa.	70c N. T.
Stoneboro, Pa.	80c N. T.
Sandy Lake, Pa.	80c N. T.
Polk Lake, Pa.	90c N. T.
Franklin, Pa.	90c N. T.
Oil City, Pa.	100c N. T.

To	Present
Simons, O.	†70c N. T.
Osgood, Pa.	*11c Cwt.
Amasa, Pa.	*13c Cwt.
Stoneboro, Pa.	*13c Cwt.
Sandy Lake, Pa.	*14c Cwt.
Polk Lake, Pa.	*13c Cwt.
Franklin, Pa.	*14c Cwt.
Oil City, Pa.	*15c Cwt.

†Jamestown, Pa., rate under intermediate clause N. Y. C. I. C. C. L. S. 1649.
*Sixth class per O. C.

37338. To establish on (a) **washed or processed silica sand,** and (b) **crude silica sand,** C. L., from Millington, Oregon, Ottawa, Rochelle, Sheridan, Utica and Wedron, Ill. (Rates in cents per net ton):

To	Pres. Rates (a)	(b)	Prop. Rates (a)	(b)
Tiffin, O.	276	230	252	210
Toledo, O.	252	210	252	210
Fostoria, O.	252	210	252	210

To	Pres. Routes (1)	Prop. Routes (1)
Tiffin, O.	599-635	599-635
Toledo, O.	593-654	599-635
Fostoria, O.	593-654	599-635

Route 593—C. I. & V., Minooka, Ill., E. J. & E., Hartsdale, Ind., P. R. R. through Butler, Ind., and Montpelier, O.

Route 599—C. I. & V., Minooka, Ill., E. J. & E., Hartsdale, Ind., through Bucyrus, Chatfield and Carrothers, O.

Route 635—C. B. & Q. or C. R. I. & P., Chicago, Ill., Penna. through Bucyrus, Chatfield and Carrothers, O.

Route 654—C. B. & Q. or C. R. I. & P. Chicago, Ill., Penna. R. R. through Butler, Ind., and Montpelier, O.

37340. To establish on **crushed stone, stone screenings, agricultural limestone,** unburned, in bulk in open top cars, in straight or mixed carloads, from Middlepoint, O., to Kokomo, Ind., rate of 125c per N. T.

Southwestern

1959. **Crushed stone,** from Moline, Kan., to Oklahoma stations. To establish the following rates in cents per ton of 2,000 lb. on crushed stone (broken stone ranging in size up to 200 lb. weight), including ground limestone, in bulk or in bags, but not including gypsum rock or asphalt rock, C. L., (See Note 3), from Moline, Kan., to Oklahoma stations shown below:

Oklahoma—Capron, 106; Brink, 106; Alva, 110; Noel, 110; Avard, 114; Waynoka, 118; Gage, 142; Shattuck, 142; Goodwin, 142; Fair Valley, 122; Manchester, 98; Gibbon, 98; Wakita, 102; Clyde, 102; Byron, 102; Burlington, 106; Cherokee, 106; Jet, 110; Nash, 118; Douglass, 118; Marshall, 118; Lovell, 114; Guthrie, 106; Carmen, 110; Aline, 114; Orienta, 118; Fairview, 122; Longdale, 126; Canton, 126; Cashion, 132; Navina, 110; Yale, 106; Boise City, 178. Purpose is to meet truck competition.

1998. **Sand,** from Osage and River Sand, Okla., to Texas points on U. T. Co. To establish a rate of $1 per ton of 2,000 lb., not subject to emergency charge, on sand, C. L., subject to minimum weight and description as proposed in S. W. L. Tariff 162-F, from Osage and River Sand, Okla., to Union Traction Co. stations, Independence, Kan. (Index 60), to South Coffeyville, Okla. (Index 115) (index numbers as shown in Chairman Leland's Open and Prepay Station List). (Present rate, $1.10, plus 6c emergency charge.)

2059. **Crushed stone,** from Arkansas City, Kan., to West Cleo and Orienta, Okla. To establish rate of 97c per ton of 2,000 lb. on crushed stone, description and minimum weight as per Items 10-A and 15-A, S. W. L. Tariff No. 162-F, from Arkansas City, Kan., to West Cleo and Orienta, Okla. Present rate, $1.15.

2070. **Limestone, ground, in mixed carloads with lime,** from points in Arkansas and Missouri to southwestern points including points in Kansas and Missouri. To establish a rule in Mo. Pac. R. R. Tariffs Nos. 3875-J and 6708-D, and St. L.-S. F. Ry. Tariff No. 69-L, to provide that the rates on lime will apply also on limestone, ground, in bags or sacks, in mixed carloads with lime.

2071. **Sand and gravel,** from Arkansas City,

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Kan., to West Cleo and Orienta, Okla. To establish rate of 97c per ton of 2,000 lb. on sand and gravel, description and minimum weight as per Items 10-A and 15-A of S. W. L. Tariff No. 162-F, from Arkansas City, Kan., to West Cleo and Orienta, Okla. Present rate $1.15.

2084. **Sand, gravel and crushed stone,** weights on shipments not track-scaled in transit, from, to and between southwestern points. To establish on state and interstate traffic from, to and between points covered by S. W. L. Tariff 162-F, a rule reading as follows: "When track scales are not available at point of origin or destination and shipment does not pass through a point where the carrier transporting the shipment maintains a track scale, the shipment shall be delivered upon basis of 10% above the marked capacity of the car, provided, however, that upon presentation of original or certified copy of invoice showing the actual weight, or satisfactory evidence acceptable to the carrier, as to the actual weight of the shipment, the car shall be delivered upon basis of such actual weight."

Illinois

7497-A. **Agricultural limestone,** C. L., (See Note 2), from Krause and Stolle, Ill.

To (Rep. Pts.)	Present	Proposed
East Alton, Ill.	90	73
Whitehall, Ill.	87	86
Winchester, Ill.	97	97
Bushnell, Ill.	127	127
Nameoki, Ill.	75	73
Greenridge, Ill.	98	86
Manchester, Ill.	103	86
Jacksonville, Ill.	111	98

Southern

2780. **Stone,** crushed or rubble, C. L., Barham and Lassiter, N. C., to Fort Monroe, Va. Present rate, 226c per net ton. Proposed rate on stone, crushed or rubble, C. L. (See Note 3), from Barham and Lassiter, N. C., to Fort Monroe, Va., 145c per net ton.

2926. **Phosphate rock,** crude lump, or phosphate rock, crude ground, or limestone, phosphatic, C. L., stations on the L. & N. R. R. and N. C. & St. L. Ry. in the Mt. Pleasant-Centreville district, to East St. Louis, Ill., and St. Louis, Mo. Present rate, 341c per net ton. Proposed rate on phosphate rock, crude lump, or phosphate rock, crude ground, or limestone, phosphatic, in bulk or in bags, C. L., minimum weight as per Items 42 and 43 of L. & N. R. R. I. C. C. A16079, from and to the above named points, 256c per net ton (to expire March 31, 1934, unless sooner canceled, changed or extended).

2927. **Phosphate rock,** crude lump or phosphate rock, crude ground, or limestone, phosphatic, C. L., stations on the L. & N. R. R. and N. C. & St. L. Ry. in the Mt. Pleasant-Centreville district, to Buffalo, N. Y. Present rate, 524c. Proposed rate on phosphate rock, crude lump or phosphate rock, crude ground or limestone, phosphatic, in bulk or in bags, C. L., minimum weight as per Item 42 of L. & N. R. R. I. C. C. A16079, from and to the above named points, 412c per net ton (to expire March 31, 1934, unless sooner canceled, changed or extended).

3003. **Sand, gravel, slag, crushed stone and chert,** C. L., between stations on the V. & C. S. R. R., also between stations on the V. & C. S. R. R., on the one hand, and points in S. F. A. territory, on the other. It is proposed to amend Agent Speiden's I. C. C. 1635 and I. C. C. 1740, for account of the V. & C. S. R. R. to extent of increasing rates in the amount of 25c per net ton, the customary relief-line arbitrary applicable on sand, gravel, crushed stone, etc.

Western

2079. **Stone,** crushed, C. L., (See Note 3), from Wausau, Wis., to Minneapolis, Minnesota Transfer and St. Paul, Minn. Rates: Present—9c per 100 lb. Proposed—7c.

8620. **Stone, crushed** (See Note 3), from Wausau, Wis., to Manville, N. J. Rates: Present—720c per net ton. Proposed—600c.

8132-1. **Rock,** asphalt, natural or coated with not to exceed 5% road oil, **Stone,** crushed or ground **sand and gravel,** coated with not to exceed 5% of road oil. (See Note 3.) From Topeka, Kan., to Kansas destinations. Rates: Present—combination of local rates or class rates per W. T. L. Tariff 231. Proposed, same distance schedule of rates shown in Item 235-A, Supplement 30, W. T. L. Tariff 210 for both single and joint line application.

I. C. C. Decisions

25540. Bitminous Asphalt Rock. (Sandstone). By division 3. Rates from Rockport and Bowling Green, Ky., to Decatur, Ind., found not unreasonable or otherwise unlawful. Case dismissed.

25697. Sand. By division 4. Rates from Clayton, Ia., to Omaha, Neb., called applicable and not unreasonable; shipments not misrouted.

25480. Crushed Asphalt Rock. By division 4. Rates from Dougherty, Okla., to Manhattan, Kan., and Blythedale and Trenton, Mo., found inapplicable in certain instances. Applicable rates found unreasonable to the extent they exceeded 17 c to Manhattan; 21 c to Trenton direct, 22 c to Blythedale and 25 c to Trenton through Kirksville, Mo. Reparation awarded.

25059. Natural Asphaltic Limestone and Asphaltic Limestone. By division 5. Rates on the former C. L., from Margerum, Ala., to destinations in official territory found not unreasonable. Asphaltic limestone rates to which asphalt has been artificially added, C. L., from and to the same points found unreasonable. Reparation awarded.

3876. Cement. By division 3. Proposed cancellation of rule for constructing combination rates from points in eastern trunk line territory to western trunk line territory points and in Utah and Wyoming found justified. Order of suspension vacated.

3877. Lime and plaster. By division 3. Proposed cancellation of the application of combination rule in connection with commodity rates on lime and plaster, C. L., between points in western trunk line territory, found justified. Proceeding discontinued.

25409. Barytes Ore. By division 3. Rates from Mesa, Ariz., to Odessa, Tex., on ground and ground and mixed barytes from Odessa to Hobbs, New Mex., found not unreasonable. Case dismissed.

24936. Sand. O. A. Smith Agency, Inc., vs. Illinois Central Railroad Co., et al. Reparation awarded. Affirmation made that rates on crude sand with 2 or 3% natural bituminous content, C. L., from Big Clifty, Ky., to Ironton, O., and Milwaukee, Wis., were unreasonable.

24568. Sand and Gravel. By division 5. Missouri Gravel Co. vs. Chicago, Burlington and Quincy Railroad Co. Rates from La Grange, Mo., to destinations in Illinois, modified.

25306. Bituminous Rock. Crown Rock Co. vs. Baltimore and Ohio Railroad Co., et al. By division 3. Carload rates from Big Clifty, Ky., to Johnstown and New Brighton, Penn., Wyandotte, Wayne, Grand Haven and Saginaw, Mich., also Milwaukee and Menasha, Wis., found not unreasonable. Complaint dismissed.

25278. Gravel. Harrison Engineering and Construction Corp., vs. Chicago, Burlington and Quincy Railroad Co. By division 5. Rates charged, C. L., during 1930 from eastern Nebraska points to certain destinations in western Iowa found not unreasonable. Complaint dismissed.

24439. Gypsum. Marietta Paint and Color Co., vs. Baltimore and Ohio Railroad Co. by the commission. Rates to High Point on gypsum, C. L., from Easton, Penn., found unreasonable. Reasonable rates prescribed and reparation awarded.

14506 and 14531. Sand and Gravel. Fourth section. By division 2. Authority granted on conditions to establish and maintain rates on sand, gravel, etc., and on pulverized oyster-shell screenings, C. L., from, to, and between points in southwestern and adjacent territories without observing the long-and short-haul provision.

14794 and 14964. Crushed stone, marble, granite. Fourth section. By division 2. Authority granted on conditions to establish and maintain rates on crushed stone, marble and granite, C. L., between points in southern territory on one hand and points in trunk line and New England territories on the other hand without observing long and short haul provision.

25553. Plasterboard. Certain-teed Products Corp. vs. Atchison, Topeka and Santa Fe et al. Also United States Gypsum Co. vs. Amador Central et al. Rates from Fort Dodge, Ia., Southard, Okla., and Acme and Sweetwater, Tex., to points in California, New Mexico, Colorado, Arizona, Nevada and Oregon, not unreasonable.

Hearing on Cement Rates

EXAMINER J. EDGAR SMITH, for the interstate commerce commission, heard testimony October 4, on objections to certain Oregon and Washington cement companies to rates on all-rail trans-shipments connecting northern and southern California points. Combination rail, water and all-rail shipment rates which they claim give California cement companies undue advantage, also were considered.

Plaintiffs who have filed objections include the Beaver Portland Cement Co., the Oregon Portland Cement Co., Spokane Portland Cement Co., Lehigh Portland Cement Co., Northwestern Portland Cement Co., Olympic Portland Cement Co., and Superior Portland Cement, Inc.

Sand-Lime Brick Production and Shipments in September

THE following data are compiled from reports received direct from producers of sand-lime brick located in various parts of the United States and Canada. The accompanying statistics may be regarded as representative of the industry.

Eleven sand-lime brick plants reported for the month of September, this number being four less than the number reporting for the month of August, statistics for which were published September 25:

Average Prices for September

Shipping point	Plant price	Delivered
Detroit, Mich.	....	$11.50
Saginaw, Mich.	10.00	....
Dayton, Ohio	10.00	11.00
Madison, Wis.	11.00	12.50
Syracuse, N. Y.	20.00	22.00
Pontiac, Mich.	9.50	11.50
Mishawaka, Ind.	....	8.50
Grand Rapids, Mich.	....	12.00
Toronto, Ont., Can.	12.00	13.50

Statistics for August and September

	†August	*September
Production	2,083,900	903,200
Shipments (rail)	58,000	15,000
Shipments (truck)	1,418,755	975,187
Stocks on hand	3,130,066	2,608,434
Unfilled orders	865,000	315,000

†Fifteen plants reporting; incomplete, five not reporting unfilled orders.

*Eleven plants reporting; incomplete, four not reporting unfilled orders.

Digest of Foreign Literature

By F. O. Anderegg, Ph. D.
Consulting Specialist, Pittsburgh, Pa.

Colonial Concretes. R. Feret discusses some of the troubles of concrete in hot, dry climates and points out the importance of controlling the water content and the setting time of the cement and of proper curing. He has carried out a series of tests on a mixed cement made by grinding two parts of standard portland with one part of Gaize, a pozzuolannic material found in the valley of the Seine. This cement, then, is similar to that described at the recent A. S. T. M. meeting by Carlson and Troxell, as reported elsewhere in this issue.

The Gaize cement required more mixing water, had a slower setting time, was much more plastic and resisted the chemical attack of disintegrating solutions much better than the portland cement used. Feret prepared a number of gradings of aggregate, ranging from that recommended by Bolomey to others such as used in colonial work, which were poor. In one mix he displaced some of the sand with limestone dust, which slightly decreased the compactness and had a deleterious effect on the resistance to sea water. Compressive strengths in these concretes at 28 days were slightly lower (about 12%) with Gaize cement than with portland.

To determine better the resistance to sea water, three series of mortar specimens were made up. The consistency was observed with a plunger apparatus and a flow table. Bars 4x4x16 cm. were made up and stored for 27 days. Then they were placed in the cellar and two were broken in flexure and the fragments in compression on the 28th day. The other two were immersed in sea water and broken at the age of one year. The first series was molded with the same water-cement ratio as the concretes at 15 deg. C. The second was made up with less water to a plastic consistency and stored in the furnace room, corresponding to a tropical climate. In the third series, the ingredients were heated to about 37 deg. C. so that setting was greatly accelerated and the consistency was considerably drier. The 28-day strengths of the three series were about in a ratio 3:2:1 for the portland cement, showing the deleterious effect of evaporation on the hardening. On breaking after storage during the next 11 months in sea water, all gained in strength, but those which had dried out most at first showed the greatest amount of increase. Whereas the Gaize cement specimens in the first series gave about 8% lower strength, in the second series they were 12% better, at one year.

While none of the specimens stored in sea water showed any evidences of decomposition at the end of one year, most of those pieces stored in 5% magnesium sulfate were attacked. The specimens containing limestone dust started to crack in three weeks and fell apart in six. Those with poorly graded aggregates and portland cement started to crack in 9 months. Those with the better grading showed, when made with portland cement, a start of cracking at the end of one year, while those containing Gaize cement were still perfect. These all belonged to series 1 with very wet mixes. Those of series 2, with less water, stood up better as did those of series 3. *Revue des Materiaux de Construction et de Travaux Publics.* 1933, No. 285, pp. 157-164.

The Work Done in Placing Concrete and Its Compressive Strength. In central Europe standard methods of testing cement call for the use of an earth-dry mix pounded vigorously in the molds, whereby higher strengths are obtained than with plastic mixes placed by hand. In a similar way, wherever possible they have tried to place concrete by thorough tamping of dry-mixed concrete; but sometimes this is carried too far, just as in this country (U. S.) we have often gone to the other extreme.

Tamp Tests

Frant. Lauser of Prague has carried out a study of the effect of the amount of work done in placing the concrete, as determined by the number of tamps applied to the fresh concrete, on the resultant compressive strength. He has worked with standard and high early strength portlands and with an aluminous cement, at several different consistencies ranging from earth-dry to liquid with water-cement ratios from 0.38 to 0.98 and with cement contents running from 3 to 6 sacks of cement per cubic yard. River sand and gravel were combined 3:5 with a fineness modulus of 6.4.

Wide Range of Results

As the consistencies increased, the strengths of the cubes molded with less work approached those where more work had been done with cement content greater than 4 sacks per cubic yard. Where appreciable reinforcing is present, the consistency must be sufficently liquid to place without too much work. Where it is possible to compact the concrete, where little or no reinforcing is present, the driest consistencies develop highest compressive strengths; but where high early strength or aluminous cements are used, it is better to have a plastic consistency because the compressive strengths are higher than with a dry mix. When lean mixes are used, best strength results are obtained for all cements with thoroughly tamped dry mixes. These results are in line with recent developments in this country involving vibration. *Beton und Eisen.* 1933. V. 32, No. 11, pp. 171-174.

Patent Abstracts

The following brief abstracts are of current process patents issued by the U. S. Patent Office, Washington, D. C. Complete copies may be obtained by sending 10c to the Commissioner of Patents, Washington, D. C., for each patent desired.

Preparation of High Plastic Lime. The preferable material for this process is shell from San Francisco Bay, Calif., although other materials, high in calcium, low in magnesia and very low in silica may be used. The burning is preferably in a rotary kiln and the temperatures must be between 1400 and 1700 deg. C. instead of the usual 1200. The lining of the rotary kiln should be free from silica and is preferably of periclase, although magnesite, chrome and carborundum bricks may be used, though less desirable. The inventor claims that the lime made in this way has a putty volume of 8 cu. ft. per bbl. of 180 lb. and that plasticity of 650 and more are shown when tested by the A. S. T. M. standard method.—*Max Y. Seaton, Assignor to California Chemical Corp., Newark, Calif. U. S. Patent No.* 1,872,512.

Producing a Lime Product. The process covered is briefly, to slake any ordinary quicklime, to remove the portions that do not hydrate readily by one of several means mentioned and to recalcine the remainder after adding retarding compounds. The slow hydrating particles may be removed by aging, by making a milk and screening, by making into a dry hydrate and separating by air and by flotating off the fine particles. The retarding compounds mentioned include sea salt, sodium and calcium chlorides, sodium borate, sodium carbonate and magnesium and barium chlorides. Without these the lime after recalcining would hydrate with explosive violence and make a granular putty. The advantage claimed by the inventor is that he can make a satisfactory plastic lime from almost any limestone, or, as he claims, it will give uniformity to all limes.—*W. C. L. Hemeon, Assignor to Rockland and Rockport Lime Corp., Rockland, Me. U. S. Patent No.* 1,856,763.

Sound Absorbent Plaster. Porous or sound absorbent plaster is regularly made by mixing an aggregate like sand or slag with just enough binder, such as portland cement or a gypsum plaster, to stick the grains together, leaving pores throughout the mass. The inventor of the process described says

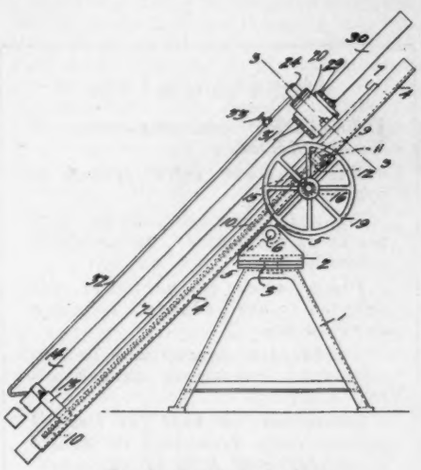
that the product is much improved when an agent which lowers the surface tension of water is added. The water becomes more responsive to capillarity, thus bringing a greater amount of the bonding material in the contacting areas and leaving the pores more open. The aggregate recommended is slag crushed and separated to a 12 to 20-mesh product, although sand will do as well except for its greater weight. The binder may be portland cement or a gypsum plaster; ordinary plaster of Paris sets too rapidly, unless retarders like microcosmic salt or calcium acetate are used. The preferred agent for lowering surface tension is sodium benzenesulphonate, although a list of other agents that may be used is given. A sample mix is: Parts by weight, 12 to 20-mesh slag, 300; plaster of Paris, 125; microcosmic salt or calcium acetate, 2 or 3, respectively; Sodium benzenesulphonate, 1, water 85.—*A. W. Schorger, Assignor to C. F. Burgess Laboratories, Inc., Madison, Wis. U. S. Patent No.* 1,848,386.

Filler for Plastics and Method of Making. This patent covers the making of silica particles from a siliceous solution to take the place of finely ground natural silica. A colloidal solution of silicic acid is sprayed into hot air, or a solution of sodium silicate is sprayed into an atmosphere of carbon dioxide, so as to make fine particles of silica when dried. These are then "attrited" in a ball mill, that is ground sufficiently to roughen the surfaces without materially changing the size of the grains. This was found necessary to increase the wetability of the grains. The product is used in the manufacture of rubber materials. —*R. B. McClure and J. W. Church, Assignors to Pure Calcium Products Co., Pittsburgh, Penn. U. S. Patent No.* 1,843,576.

Heat Treatment of Garnet Abrasive. Inventor claims that if crushed garnet is heated at temperatures from 400 to 950 deg. C. the garnet changes remarkably in physical and chemical properties. The red color is deepened and the grains become lustrous and the abrasive qualities are greatly improved. Treatment above 1000 deg. C. he finds has a detrimental effect, tending to break down the crystalline structure. He claims that when used on drum sander or similar machine the heat treated garnet will abrade approximately twice the area as the untreated garnet.—*Edwin W. Colt, assignor to Armour and Co. of Chicago, U. S. Patent No.* 1,836,448.

Batching Plant. The main feature of this invention is a batching truck with partitions that can be set to hold any desired proportions of concrete materials. The truck runs on a track below the spouts of material bins or silos. After loading it is run to a partitioned hopper above the mixer and discharged. The materials will flow into the mixer from this hopper in the proper proportions, thus insuring uniformity. By handling two or more batches at a time labor is saved. *P. Grunberger, Jerusalem, Palestine, U. S. Patent No.* 1,790,143.

Sand Dredge or Elevator. This device resembles an air or steam ejector. Only the working portion is shown here. Air under high pressure is admitted to the pipe (24). It goes into the narrow annular space surrounding the suction pipe and blows into the discharge pipe (30) close to the wall, after



Sand elevator design

passing the throat formed by the ring at 29. The inventor says that "the invention has been found under repeated actual practice to deliver greater quantities of sand than has heretofore been accomplished by other methods, and at a less expenditure of energy."—*C. B. Thompson. U. S. Patent No.* 1,833,341.

Making Mineral Granules for Stock Feed. The moistened, finely-ground mineral is forced through a plate with holes, in the manner of a household meat grinder. A "finger" makes short cylindrical granules of the threads forced through the end plate. The patent covers the use of a multiple device by which granules may be made of mixtures of several dry constituents. Rock phosphate, ground limestone, salt cake, charcoal and salt are mentioned for such use.—*Grover E. Pfeiffer, assignor to Moorman Manufacturing Co., Chicago, U. S. Patent No.* 1,825,475.

Publications Received

Mineral Production of Canada (Department of Trade and Commerce, Dominion Bureau of Statistics). Revised statistics for calendar year 1932 and statistics for six months ending June, 1933.

Minerals Yearbook (United States Bureau of Mines, Washington, D. C.). In the first issue, just published, the announcement is made of a change in the method of presenting statistics and economic discussions on minerals. This volume, bearing the date 1932-1933, furnishes timely statistical information regarding all commercially important minerals. It takes the place of "Mineral Resources of the United States," which has been issued annually for over half a century, and presents a statistical and economic resumé of conditions in the mineral industries. Fifty-nine authors, all on the Bureau staff, contributed to the 61 economic and statistical surveys in this volume. There are 819 pages, divided about equally between descriptive text and charts and tables. The cloth binding is distinctive, and the volume provides the mineral industries with adequate data in more convenient form at an earlier date than elsewhere or heretofore available. Copies may be purchased by anyone for $1.25 from the Superintendent of Documents, Government Printing Office, Washington, D. C.

The Significance of Current Trends in Sewage Treatment (National Lime Association, Washington, D. C.). A discussion by W. V. Brumbaugh, secretary of the association, with particular reference to the part played by lime. His concluding paragraph is: "We must visualize the steady, substantial tonnage of lime which will result from the installation of chemical precipitation plants for treating sewage. This daily demand for the product of the kilns will go a long way towards absorbing some of the excess capacity of the industry and starting it on the road to profitable recovery. With the information that from 500 to 1,500 lb. of lime per million gallons of sewage flow are required by some of the newer processes, the gross potential tonnage can easily be calculated."

The Stability of the Agricultural Lime Market (National Lime Association, Washington, D. C.). A paper by H. A. Huschke, of the association, giving statistics of the industry and data on some new uses for lime, notably in the control of poultry parasites and diseases and in the control of soil characteristics which cause corrosion of underground piping. His charts show that the demand for agricultural lime has remained practically constant from 1923 through 1932, while the demand for agricultural limestone has fluctuated over 100%.

Fire Tests of Columns Protected with Gypsum (United States Bureau of Standards, Research Paper RP563). Fire tests of six building columns protected with gypsum were made to supplement previous fire tests of columns similarly protected. These tests demonstrate the importance of some positive bond, such as steel cramps, or ties, to hold unplastered block coverings in place. Block coverings with sanded gypsum plaster finish shrank less than the unplastered blocks and remained in place during the fire until the blocks had failed. The plaster applied to the block coverings increased the fire resistance in greater proportion than the ratio of the squares of the resulting net thicknesses of covering outside of the steel.

This Code Is Now *Law* in the Lime Industry

By Proclamation of the President, October 13, Every Lime Manufacturer in the United States Is Bound by Its Provisions

FRIDAY, the 13th of October, the Code of Fair Competition for the Lime Industry became part of the law of the land, by proclamation of President Roosevelt, who signed the code, very much as prepared by the lime industry, on October 3. With the possible exception of the Iron and Steel Institute, no trade association so far as known has accomplished so much in getting what it wanted with little or no fuss or publicity of an embarrassing kind, as has the National Lime Association.

The more important parts of the Code by which the lime industry is now governed are:

Labor—Hours—Wages

Working Hours.—No employe (except outside salesmen) shall work in excess of 8 hours in any one day or in excess of 40 hours in any week; provided, however, that these limitations shall not apply in periods of seasonal peak demand or in the event of lack of storage facilities, or emergencies, but in no event shall the total working hours of any employe, averaged over a 6 months' period, exceed 40 hours per week. All overtime work in excess of 8 hours per day shall be paid for at not less than one and one-half times the hourly rate. These maximum hours shall not apply to foremen, superintendents, managers, officials, or others compensated on a regular salary basis in excess of $35 per week.

Rates of Wages.—The minimum rate of wages for employes, excluding accounting, clerical, and office employees, shall not be less than 30 cents per hour in all territory south of the northern boundary of Virginia, Tennessee, Arkansas (including the manufacturing section known as southwestern Missouri), Oklahoma, New Mexico, and Arizona and in all other territory the minimum wage rate shall be not less than 37½ cents per hour. There shall be an equitable readjustment of compensation now in excess of the minimum wages herein established.

The minimum rate of wages for accounting, clerical, or office employes shall be not less than $15 per week in any city of over 500,000, or in the immediate trade area of such city; $14.50 per week in any city of between 250,000 and 500,000 population, or in the immediate trade area of such city; $14 per week in any city of between 2,500 and 250,000 population, or in the immediate trade area of such city; and $12 per week in towns of less than 2,500 population. Population shall be determined by the 1930 Federal census.

Employes who by reason of old age or physical infirmities are incapable of normal productive effort may be compensated at a rate not less than 80% of the foregoing minimum rates of pay, but the number of such employes shall not exceed 5% of the total number of employes from time to time employed.

High Points in Code

UNIFORM cost accounting is established.

Basing point price system is provided for.

Weighted average district costs are to be determined, below which a manufacturer must not sell.

Prices must be published and adhered to until changed upon five days' notice.

Confidential agency may be employed to investigate alleged unfair practices.

Quotations to hold for limited periods only, depending on nature of product and kind of customer.

Trade Relations Committee of the National Lime Association is Code Authority with specifically defined powers.

District Control Committees have wide authority in their districts to police the code.

Marketing

Uniform Cost Accounting.—The Trade Relations Committee (hereinafter described) upon reasonable notice to the District Control Committees and acting upon their recommendations, shall immediately prepare and adopt for use in the Industry, and shall submit to the Administrator for his approval not earlier than 10 days after submitting the same to each District Control Committee (hereinafter described), a standard uniform system or method of cost accounting. Upon such approval by the Administrator all manufacturers shall maintain at all times an accurate record of all costs in accordance with such system or methods or in such other manner as will clearly indicate and make available the information required thereby. Such system or method shall specify the items which shall be included in determining each manufacturer's cost.

Standard Forms—Each District Control Committee, in co-operation with the Trade Relations Committee, shall prepare immediately standard forms for quotations and contracts for use by manufacturers producing in the district to the end of standardizing such forms as far as possible in all districts, which forms shall specify the terms and conditions under which quotations and contracts for sale shall be made. When so prepared and approved by the District Control Committees, copies of such forms shall be sent to the Trade Relations Committee, and shall be submitted by it to the Administrator for his approval. Upon the Administrator's approval thereof, no manufacturer in any district shall quote or sell lime or lime products on terms or conditions at variance from those specified in the forms approved for that district.

Methods of Selling

Establishment of Basing Points.—The practice of determining delivered prices for lime in given markets, by the utilization of a basing point or points, plus the prevailing rail freight rates, has been a long-standing custom in the Industry.

Each District Control Committee (hereinafter in this Code provided for) may establish for its district a basing point or points (and change or revise the same from time to time as conditions warrant), which basing point or points shall be fair and reasonable as to all interested parties; provided, that in the event no such District Control Committee shall have been elected in any district within 20 days after the effective date of this Code, then such basing point or points shall be established for such district by the Trade Relations Committee acting upon the recommendations of the manufacturers therein.

Weighted Average District Costs.—Each District Control Committee shall determine within its own district, and from time to time revise and promulgate for the guidance of the Industry, the weighted average cost of each industry product manufactured in such district. Such cost shall be based upon the costs of individual manufacturers. In case of a district having no District Control Committee the manufacturers in such district shall report to the Trade Relations Committee, or its designated agency, necessary data to enable the Trade Relations Committee to determine weighted average costs for each industry product manufactured in such district, and the Trade Relations Committee shall determine such costs and promulgate the same for the guidance of the Industry. Such average costs shall be subject to the approval of the Administrator and the substantiating data shall be open to his inspection at all times. Such determination of cost shall be made in such manner that individual figures are kept confidential and shall not be available to competitors.

After such average cost of each industry product is so determined for any district, no manufacturer in the industry shall sell any such industry product for delivery in such district at less than such average cost, plus basing rail freight. Any sale in any such district by any manufacturer at less than such average cost, plus basing rail freight, shall be an unfair method of competition.

Price Publication.—Each manufacturer in the industry shall, within 10 days after the effective date of this Code, file with the District Control Committee a list showing the basing point prices, and terms and conditions of sale for each of the products offered for sale in each district by such manufacturer and after the expiration of such 10 days period, every manufacturer shall at all times maintain on file with the District Control Committees a list showing the basing point prices and terms and conditions of sale except as herein provided. Each such

list shall state the date upon which it shall become effective, which date shall not be less than 5 days after the date of filing such list; provided, however, that the first list of prices and terms and conditions of sale filed by any manufacturer, as above provided, shall take effect on the date of filing thereof. None of the prices and terms and conditions of sale shown in any list filed by any manufacturer, as herein provided, shall be changed except by the filing by such manufacturer with the District Control Committee of a new list of basing point prices and terms and conditions of sale which shall become effective on the effective date therein specified, which shall not be less than 5 days after the date on which such new price list and terms and conditions of sale shall have been so filed. In case any district shall not have elected a District Control Committee, then the manufacturers selling within such district shall file their prices and terms and conditions of sale for such district with the Trade Relations Committee in the same manner and under the same conditions as those above stated for filing with the District Control Committees.

All such price lists and terms and conditions of sale filed with the District Control Committee shall be immediately distributed among the manufacturers within the district, and a copy filed with the Trade Relations Committee and all such price lists and terms and conditions of sale filed with the Trade Relations Committee shall be immediately distributed to all manufacturers in the Industry interested therein.

In the event that any manufacturer shall not receive sufficient notice of the filing by any other manufacturer of revisions in such other manufacturer's prices or terms and conditions of sale, as will enable him to meet such revisions of such other manufacturer on the effective date thereof, then if such manufacturer shall file with the appropriate committee such revisions in his prices and terms and conditions of sale as may be required to meet the revisions filed by such other manufacturer, within forty-eight hours after receipt of notice thereof, the revisions so filed by such manufacturer shall become effective on the same date as the revisions of such other manufacturer, or if they be already effective, shall become effective immediately.

The failure of any manufacturer to adhere to his prices, terms, and conditions of sale, filed as herein provided, and any other deviation from the provisions of this section, shall be an unfair method of competition.

Reports for the President.—The Trade Relations Committee shall, prior to the expiration of the four-month period herein below specified, make to the President, (of the United States) a report and recommendations as to the effect of the basing point and average cost provisions of this Code upon prices in the industry, upon such other matters as it may deem pertinent to properly inform the President upon the operations of this section, and upon such matters as may be requested by the President or the Administrator.

The foregoing provisions with regard to basing points and average costs herein above described are experimental and tentative so far as this Code is concerned, and shall continue in effect for a period of four months after the effective date of this Code in order to afford the President an opportunity to determine upon the recommendations of the representative or representatives appointed by the Administrator to the Trade Relations Committee as hereinafter provided (which recommendations shall be made periodically or as often as the representative or representatives deem necessary or advisable but in any event not later than 4 months after the approval date of this Code) and upon the report and recommendations of the Trade Relations Committee, whether such provisions will effectuate the purposes of the National Industrial Recovery Act and whether such provisions are beneficial or detrimental to the industry or to the public; subject, however, to the reserved power of the President to cancel or modify his approval thereof and subject also to the further proviso that the establishment and revision of the basing points and average costs and the operation of the foregoing provisions as to basing points and as to average costs shall at all times and in any particulars be subject to the review and disapproval of the Administrator. The President or the Administrator may call upon all manufacturers in the industry for such data and information as they may consider helpful for the foregoing purposes. Subject to the exercise at any time of any powers hereinbefore reserved to the President or the Administrator, the provisions of this section shall continue in effect as a part of this Code after the expiration of said four months' period.

Information of a confidential nature shall be collected through a confidential agency and be handled in such a way that the individual costs, profits, and other like data will not be reflected in any report or publication or made available to other members of the Industry.

Unfair Methods of Competition

The *unfair* practices prohibited include (1) departure from agreed working conditions; (2) selling below cost; (3) commercial bribery; (4) rebates, subsidies, etc.; (5) lump sum bids and contracts; (6) combination sales; (7) inducing breach of contract; (8) defamation of competitors; (9) use of old packages; (10) misrepresentation; (11) false branding; (12) imitation of trade marks; (13) selling on consignment; (14) jobbers, distributors and brokers who violate code; (15) shipment without orders; (16) protected contracts (those entered prior to code only to be fulfilled at prices quoted); (17) unlimited periods for price quotations; (18) false classification; (19) substitution; (20) contingent sales, and (21) splitting of commissions.

Selling Below Cost.—In addition to the restrictions already described, it shall be an unfair method of competition for any manufacturer of lime or lime products to sell below his cost as defined in the standard uniform cost accounting system or method to be established for the industry as herein provided, except to meet a well-established competitive delivered market price for a product of similar grade and quality. If any manufacturer shall believe that any other manufacturer is selling at less than cost to meet an established delivered price, but that in the particular case such selling below cost constitutes an unfair marketing practice, such manufacturer shall have the right to file a written complaint with the Trade Relations Committee. The Trade Relations Committee upon receipt of such complaint shall cause to be made an appropriate investigation by such confidential agency as it may designate, which confidential agency shall make a full report thereon to the Administrator and shall file a summary of its conclusions with the Trade Relations Committee. The Administrator, upon receipt of such report shall, in co-operation with the Trade Relations Committee, take such further action thereon as he may deem appropriate, and shall have the power to direct the manufacturer or manufacturers concerned to correct any such unfair marketing practice found to exist.

Duration of Agreements

(a) Except where otherwise necessary to meet governmental bid requirements, no manufacturer shall make any quotation which shall not expire within 15 days from date of quotation; provided, however, that any such quotation may be specifically renewed.

(b) *Chemical Lime.*—No manufacturer shall contract or agree to furnish chemical lime or chemical-lime products to any purchaser for more than a calendar quarter-annual period; nor shall he make any quotation, contract, or agreement for the sale of such products for any such calendar quarter-annual period, prior to the first day of the last month of the immediately preceding calendar quarter-annual period.

(c) *Building Lime.*—In instances where building lime is sold for specific jobs in lieu of making specific job contracts with dealers and processors, a purchase order at the prevailing price will be considered as a sufficient binding contract with the provision that if the price advances at any time, a specific job contract will be written within 30 days after the price advance at the price prevailing at the date of the purchase order for the amount of lime still required.

Specific job contracts must be supported by the dealer's original order and record of prior deliveries and the contractor's written estimate of the balance required for completion. Where no specific job contract is made within 30 days after the price advance, then such jobs must take the advanced price.

(d) *Agricultural Lime Products.*—No manufacturer shall contract or agree to furnish agricultural lime or agricultural lime products to any purchaser for more than a calendar semi-annual period, nor shall he make any quotation, contract, or agreement for the sale of such product for any such calendar semi-annual period, prior to the first day of the month immediately preceding such calendar semi-annual period.

(e) *Government, State, County, and Municipal Requirements.*—No manufacturer shall submit a bid prior to ten days before the date specified for the opening of bids, and, unless a longer period therefor is specified in the proposal or by applicable law, every such bid shall specify that it shall be void if award shall not be made and contract executed within 30 days after date of the opening of bids; and only calendar quarterly contract shall be accepted, unless otherwise specified in the proposal or by applicable law.

Any deviation from the provisions of this section shall be an unfair method of competition.

Administration

Code Authority.—To effectuate the policies of the National Industrial Recovery Act and to provide for administration of this Code within the industry in co-operation with the Administrator, the Trade Relations Committee of the National Lime Association, as that committee is from time to time constituted, is hereby established as a planning and fair-practice agency for the industry. To this committee the Administrator shall from time to time and for such periods as he may specify appoint thereto, as his representatives, or as representatives of such groups as he may designate, not more than three members without vote.

The President or the Administrator may upon complaint and after such hearing as he may prescribe, take such action as he may

deem necessary to insure that the Trade Relations Committee is fairly representative of the districts and of the industry as a whole.

Trade Relations Committee

In addition to the powers and duties herein specifically conferred upon the Trade Relations Committee, it shall have the following powers and duties:

(*a*) The Trade Relations Committee shall have the right to establish its own rules for the conduct of its business.

(*b*) In order that the President may be informed of the extent of observance of the provisions of this Code and of the extent to which the declared policy of the National Industrial Recovery Act as stated herein is being effectuated in the Lime Industry, the Trade Relations Committee shall make such reports as the Administrator may require, periodically, or as often as he may direct, and each manufacturer shall, in the manner hereinafter provided, make such reports, to be sworn or unsworn as the Trade Relations Committee may specify, periodically or as often as it may direct, concerning wages, hours of labor, conditions of employment, number of employes, and other matter pertinent to the purposes of this Code as the Administrator, through the Trade Relations Committee, may from time to time require.

Each manufacturer subject to the jurisdiction of this Code and accepting the benefits of the activities of the Trade Relations Committee hereunder shall pay to the Trade Relations Committee his proportionate share of the amounts necessary to pay the cost of the assembly, analysis, and publication of such reports and data, and of the maintenance of the said Trade Relations Committee and its activities. Said proportionate share shall be based upon the total tonnage of quicklime and hydrated lime manufactured and sold during such representative period but not less than one year, as the Trade Relations Committee may select. The Trade Relations Committee may designate the National Lime Association or any other appropriate agency, to assist it in maintaining its accounts, determining such proportionate shares and in securing the collection thereof.

At the option of any District Control Committee, such reports may be collected and compiled by it for the district. In case any District Control Committee (as hereinafter provided) or a majority of the manufacturers in any unorganized district shall require it, such reports for that district shall be collected through a confidential agency appointed by such District Control Committee, or, in the case of an unorganized district, by the Trade Relations Committee. Such information shall be kept confidential as to individual reports.

The Trade Relations Committee shall compile immediate all such records in accumulated totals and averages by districts and for all districts and distribute the same to all members in the industry.

(*c*) The Trade Relations Committee may, from time to time, present to the Administrator recommendations based on conditions in the industry as they develop from time to time which will tend to effectuate the operation of the provisions of this Code, and the policies of the National Industrial Recovery Act, but before any such recommendations shall be presented to the Administrator they must be first submitted to all members of the Industry and receive the approval of members of the industry who in the preceeding year produced at least sixty per cent of the total industry tonnage produced in that year.

(*d*) The Trade Relations Committee shall co-operate with the Administrator in making such investigations as to the functioning and observance of any provisions of this Code as the Administrator may request, through such confidential agency or agencies as he may designate. All information so collected shall be kept strictly confidential except as the same is reported to the Administrator and except as may be disclosed by the Administrator for the purpose of enforcing the provisions of the National Industrial Recovery Act.

(*e*) In order to facilitate the application and operation of the provisions of this Code, the Trade Relations Committee may issue interpretations thereof, subject to an appeal to the Administrator in the manner hereinafter provided.

(*f*) The Trade Relations Committee may from time to time appoint such subcommittee or designate such agencies, and may delegate to any of them such of its powers and duties, as it shall deem necessary or proper.

Lime Industry Districts

The Industry shall be divided into "Lime Industry Districts," which districts initially established are set forth in this Code. The Trade Relations Committee may from time to time revise such districts or any of them, subject to the approval of the manufacturers within the district or districts affected, and subject to the approval of the Administrator.

The manufacturers in each district may, at a meeting called for that purpose on notice to all manufacturers in such district, at which meeting each manufacturer shall be entitled to one vote, establish therefor, upon the majority vote of the manufacturers in attendance at such meeting, a District Control Committee to consist of such number of members as such manufacturers shall determine. In order to provide, as far as practicable, and as not otherwise required by this Code, for the administration of this Code within each district by the manufacturers therein, the District Control Committee, in addition to the duties and powers elsewhere in this Code conferred upon them, shall be charged with the power and duty of supervising and enforcing the provisions of this Code within their respective districts and may make such investigations as may be necessary for that purpose.

All information necessary for any such investigation shall be reported to a confidential agency selected by the District Control Committee and shall be kept confidential except when a violation of this Code is thereby disclosed.

Each District Control Committee may consider and prepare uniform merchandising plans to be recommended to the Trade Relations Committee containing such provisions as may be deemed necessary or proper to insure fair selling methods by the manufacturers in the district and to prevent unfair competitive practices, and to consider and prepare for recommendation to the Trade Relations Committee any system of standardization of products necessary or advisable to insure fair selling methods, and to advise with the Trade Relations Committee upon any other matter pertinent to the purposes or administration of this Code.

Appeals

Any interested party shall have the right of complaint to the appropriate District Control Committee and of a prompt hearing and decision thereon in respect of any decision, rule, regulation, or course of action of such District Control Committee. Such complaint must be filed in writing with such District Control Committee within 30 days after receiving notice of such decision, rule, regulation, or course of action. The decision of such District Control Committee may be appealed by any interested party to the Trade Relations Committee.

(*b*) Any interested party shall have the right of complaint to the Trade Relations Committee and of a prompt hearing and decision thereon in respect of any decision, rule, regulation, or course of action of the Trade Relations Committee. Such complaint must be filed in writing with the Trade Relations Committee within a reasonable time after such decision, rule, regulation, or course of action is issued or taken.

(*c*) Any interested party shall have the right of appeal to the Administrator, under such rules and regulations as he may prescribe, in respect of any decision, rule, regulation, or course of action, issued or taken by the Trade Relations Committee.

(*d*) Any such complaint or controversy or any other question arising under this Code may, however, be submitted by the interested parties to arbitration under the Rules of the American Arbitration Association, and, in case of any submission to such arbitration, the decision of the arbitrators shall be final.

This Code and all the provisions thereof are expressly made subject to the right of the President, in accordance with the provision of Subsection (b) of Section 10 of the National Industrial Recovery Act, from time to time to cancel or modify any order, approval, license, rule, or regulation issued under Title I of said Act and specifically, but without limitation, to the right of the President to cancel or modify his approval of this Code or any conditions imposed by him upon his approval thereof.

Within each state, members of the trade/industry shall comply with any laws of such state imposing more stringent requirements, regulating the age of employes, wages, hours of work, or health, fire, or general working conditions, than under this Code.

First Court Case Under New Lime Code

U. S. JUDGE CLAUDE M. McCALLUM, at Dallas, Tex., has set a hearing for October 28 to determine whether the city of Dallas shall be permanently enjoined from buying lime from the Dittlinger Lime Co., New Braunfels, at $8.35 per ton.

A temporary injunction was granted by Judge McCallum on October 16 on application of John Michel, Dallas lime manufacturer, who claimed in his petition that the price which the city accepted in the bid is below the cost of production and in violation of the lime industry code.

Mr. Michel set out that the city accepted the low bid of the Dittlinger company October 12. Michel's own bid of $10.75 a ton for lime made in West Dallas, he claims, allows a reasonable profit and is in line with the code provisions.

The Dittlinger company would have to pay $4.20 a ton to ship the lime to Dallas, and with a 2% discount for cash the company would receive only $3.98 a ton, according to the petition.

The plaintiff asks that the city be prohibited from entering into a contract with the New Braunfels company and that if one has already been made, both parties be prevented from carrying it out.

Building Supply Dealers' Code

DEALERS in builders' supplies began operating on October 13 under the new code just approved for their branch of the construction industry. The compact setting forth the rules of fair competition in the building supply field was signed by President Roosevelt on October 3 and became effective ten days from that day.

It was drawn up by the joint efforts of local member associations of the National Federation of Builders' Supply Associations, which represents firms employing 80% of the men employed in the industry, doing 90% of the volume of business written. Col. John B. Rose is chairman of the National Code Authority which will administer the code. His local headquarters will be in the Grand Central Terminal, New York City. In his first official pronouncement concerning the code, Col. Rose declares that the code affects the business of any supply dealer handling any part or all of the following items classified as building material supplies: brick mortars, casement and steel sash, cement and cement products, cement pipe, ceramic tile, clay roof tile, common brick, cut stone, dampers and fireplace accessories, drain tile, face brick, fire brick and clay, glazed structural tile, gypsum products, hollow tile, lime and lime products, mesh reinforcements, metal lath and kindred products, mineral aggregates, mortar and cement colors, molding plasters, roof and flooring slates, sewer pipe, flue lining and other clay products, structural terra cotta and waterproofing compounds.

Discussing some of the provisions contained in the code, Colonel Rose said:

"Under rules of fair practice, the code provides that no dealer in builders' or dealers' supplies is to countenance rebates or premiums in any form to effect sales; and that all contractors, and this is important, 'shall be required to use uniform contracts and maximum terms of sale as established by the Code Authority, which shall be binding as law.' It is also provided that all prices, terms and conditions of sale as developed under a uniform cost accounting system shall be published by each dealer within each trading area and shall be filed with the Code Authority and that any deviation from such published prices, terms and conditions, until new prices, terms and conditions shall have been filed, shall be construed as an unfair competitive trade practice and subject to the penalty provided by law."

Code News

Mineral Aggregate Industries are still struggling with the NRA to write a code acceptable to the portable plant operators as well as to the fixed plant operators. The National Association of Portable Sand, Gravel and Stone Producers now claims to represent about 800 producers who had an alleged output of 50,000,000 tons in 1932. They are, apparently, largely road contractors. They object to nearly all the provisions of the proposed code of the aggregate industries.

Portland Cement Industry has had to make changes to satisfy building supply dealers. The code is still in the conference and re-write stage.

Gypsum Industry has filed its code and is awaiting a hearing.

Ready-Mixed Concrete Industry was scheduled for a hearing on its proposed code in Washington, D. C., October 26. Prior to the hearing there was to be a meeting of producers on October 25. Ready-mixed concrete producers will operate under their own code and not under that of the building supply dealers, which is already in effect.

California Producers Organize

COMPLETION of the organization of the Rock, Sand and Gravel Producers' Association of Northern California was announced recently. Headquarters are at 412 Chancery Building, San Francisco.

Charles M. Cadman is president of the association; Anson S. Blake, vice-president; A. K. Humphries, treasurer; R. G. Frith, assistant treasurer; E. J. Goodpastor, executive secretary.

The following compose the directorate:

Mark Hein, Hein Bros. Basalt Rock Co., Petaluma; A. G. Steblow, Basalt Rock Co., Inc., Napa; A. L. Brounless, Yuba River Sand Co., Marysville; E. H. Gerber, Del Paso Rock Products, Sacramento; V. B. Hammatt, Hammatt Rock Plant, Livingston; A. R. McMillan, Grant Service Rock Co.; Hardy Hutchinson, Hutchinson Co., Oakland; W. R. Burchell, Los Gatos Sand and Gravel Co., Los Gatos; F. H. Gates, F. H. Gates, Inc., Santa Maria; A. J. Wilson, Granite Rock Co., Watsonville; Chas. M. Cadman, Pacific Coast Aggregates, Inc., San Francisco; A. B. Ordway, Kaiser Paving Co., Oakland; A. K. Humphries, Atlas Olympia Co., San Francisco; A. S. Blake, Blake Bros. Co., San Francisco; John Daniel, Daniel Contracting Co.

The purposes of the organization are set forth in the following statement:

(1) To co-operate for the improvement and stabilization of the rock, sand and gravel industry.

(2) To eradicate unfair trade practices within the industry which produce speculation and uncertainty, and to make possible continuity of employment, adequate wages to employes and decent conditions of work.

(3) To stabilize the rock, sand and gravel industry and to maintain therein uniform and fair usages, customs and practices and contracts.

(4) To study, and so far as possible, to solve, co-operatively and collectively, the problems of the rock, sand and gravel industry.

(5) To work for the establishment of fair conditions of labor and employment throughout said industry.

(6) To distribute accurate and reliable information regarding persons, firms, and corporations engaged in said industry.

(7) To establish and maintain a system for the distribution of credit information among its members.

(8) To study, advise and recommend the enactment of legislation in the interest of said industry and to represent said industry in all of its contacts with public officials and public authorities.

(9) To promote a closer and more friendly intercourse among those in said industry.

(10) To procure the standardization of practices, products and operations in said industry.

Rhode Island Sand and Gravel Producers Organize

PRODUCERS of sand and gravel in Rhode Island have organized a corporation under the state laws "for improving the sand and gravel industry and for better interpretation of the code of the industry when and as accepted." The name is The Rhode Island Sand and Gravel Producers' Association, Inc. The association meets twice a month and its board of governors every week.

At the time the President's Blanket Code went into effect sand for all purposes was selling as low as 50c per cu. yd., and in some few cases even below that figure. Crushed stone and screened gravel were selling at from 70c to $1.00 per cu. yd. Both prices f. o. b. plants. With the organization of the association a price list has been established as follows: Concrete sand: 75c; brick sand, 90c; stone or gravel, $1.25. All prices are per cu. yd., f. o. b. plant. Base course state highway stone ranging in size from 1 to 4 in. is quoted at $1.00 per ton, f. o. b. plants. Consumers have accepted the price advances with no complaints.

The officers of the association are: Ralph Cipolla, M. A. White Co., president; Albert F. Courtois, Courtois Sand and Gravel Co., vice-president; George L. Baldwin, Interstate Brick and Sand Co., secretary; Luigi Vallone, L. Vallone, Inc., treasurer. The board of governors, in addition to the officers named, includes Frank Ricci, Ricci and Ricci Sand and Gravel Co.; Alfred H. Morse, Morse Sand and Gravel Co., and Joseph Alterieri, Rhode Island Sand and Gravel Co. The headquarters of the association are in Providence.

To Open Quarry

BINGHAMTON CRUSHED STONE AND GRAVEL CORP., Binghamton, N. Y., has announced plans to make a $15,000 addition to its operation. The company has been in the sand and gravel business for 15 years and will now open a quarry for crushed stone.

Safety Congress Draws Devotees

RETURN of workers to cement plants now that many plants are reopening or expanding operations, offers a special problem for safety engineers, plant superintendents and company doctors. This was a warning heard by a group of about 50 cement section members of the National Safety Council at their meeting October 3 in Chicago.

Considering the rate of activity in cement plants during the past year, and the fact that all safety congress sessions were competing for attendance with the American Legion convention program going forward at the same time, the executive committee of the cement section was pleased with the attendance record.

Malnutrition of idle workers during the depression period, according to expert opinion advanced at this session, increases susceptibility to silicosis and other industrial diseases in many cases. Dr. C. H. Ogden, surgeon of the Illinois Steel Co., recommended that a very complete history be required of all new employes. Such information, he pointed out, is of great value in the intelligent handling of subsequent claims.

A review of "Safety Progress in the Cement Industry" was given by A. J. R. Curtis, of the Portland Cement Association, secretary of the cement section. Discussion of this address led to many suggestions for future safety work. Several speakers emphasized the importance of maintaining a regular schedule of regional safety meetings.

Lieut. Col. H. A. Reninger, of the Lehigh Portland Cement Co., spoke of the importance of welfare work and described such work now being conducted by Lehigh and other cement companies. Rent is being remitted in houses owned by the company. Physicians have been kept on full salary in order to make them available for work among employes from whom it would be difficult for a doctor to secure payment. The company is also providing medicines where necessary. It also has furnished and prepared gardens.

Plant nurses, he said, are investigating home life and a part of their duty is to see that children are provided with milk. The Lehigh safety organization also takes responsibility for seeing that families are placed on and off relief rolls as necessary.

The commissary operated by the Giant Portland Cement Co., was briefly described. Distressed employes are given necessary food on credit. They are allowed to work out the debt at made jobs. The Penn.-Dixie Cement Corp. program also was briefly described, an outstanding feature being the loan of considerable sums of money during 1932, a large proportion of which was paid back during the spring of 1933.

R. B. Fortuin, of the Penn.-Dixie Cement Corp., acted as chairman for the meeting which elected the following as the sections' executive committee: General chairman, J. B. Zook, Great Lakes Portland Cement Corp., Buffalo, N. Y.; vice chairman, W. W. Hamilton, safety director, Alpha Portland Cement Co., Easton, Penn.; secretary, A. J. R. Curtis, Chicago; news letter editor, Jack Dempster, Canada Cement Co. Ltd., Pt. Colborne, Ont.; poster committee chairman, M. P. Greer, safety engineer, Marquette Cement Manufacturing Co., Cape Girardeau, Mo.; program committee chairman, D. B. Coleman, safety engineer, Missouri Portland Cement Co., St. Louis; membership committee chairman, H. A. Reninger, Lehigh Portland Cement Co., Allentown, Penn.; and engineering committee chairman, Frederick B. Hunt, Nazareth Portland Cement Co., Nazareth, Penn.

Members-at-large elected were: H. Vanderwerp, vice president, Medusa Portland Cement Co., Cleveland, Ohio; E. Posselt, vice president, International Cement Corp., New York, N. Y.; and C. E. Ralston, safety director, Pittsburgh Plate Glass Co., Pittsburg, Penn.

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Quarry Section

ABOUT 25 attended the meetings of the Quarry Section. Otho M. Graves, general chairman of the section, presided. He apologized for the relative inactivity of the section during the past year, due to the demands upon the chairman and others in connection with the mineral aggregate industries code. A written suggestion of S. M. Shallcross, American Lime and Stone Co., that the Quarry Section merge with the Cement Section met with unanimous disapproval.

Officers elected for the ensuing year are: General chairman, Otho M. Graves, General Crushed Stone Co., Easton, Penn.; vice chairman, William H. Baker, J. E. Baker Co., York, Penn.; secretary and news letter editor, V. P. Ahearn, National Sand and Gravel Association, Washington, D. C.; chairman of poster committee, H. F. Yotter, General Crushed Stone Co., Easton, Penn.; chairman of publicity committee, J. R. Boyd, National Crushed Stone Association, Washington, D. C.; chairman of statistics committee, W. W. Adams, U. S. Bureau of Mines, Washington, D. C.; other members of the executive committee: R. E. Colville, U. S. Gypsum Co., Chicago, Ill.; Norman G. Hough, National Lime Association, Washington, D. C.; A. L. Worthen, Connecticut Quarries Co., New Haven, Conn.; H. V. Owens, Eastern Rock Products, Inc., Utica, N. Y.; John Prince, Stewart Sand and Material Co., Kansas City, Mo.

The program covered many phases of accident prevention, including "Emergency First Aid," by Dr. H. W. Gentles; "The Mental Effects of Accidents," by C. L. Baylor, safety engineer, Louisville Cement Co., Speed, Ind.; "Safety in Quarrying Operations," by Thomas J. Quigley, Pennsylvania Department of Labor and Industry, and "Safety in Quarrying and Grading Sand," by Wayne Gyger, superintendent, Ottawa Silica Co., Ottawa, Ill.

Mr. Baylor believed that the outstanding *mental* hazards are: (1) Stupidity; (2) lack of attention (inattention); (3) irritation; (4) worry; (5) interest; (6) physical condition. He believed that a rigorous physical examination covering the usual field should be supplemented by the following special program: (1) A test of general intelligence—not "Booklearning," but such characteristics as memory, attention, adaptability to unusual situations, reason (common sense) and perseverance. (2) A test of emotional stability, meaning the ability of the person to perform certain simple tasks as previously directed, despite the distraction of other things. (3) Minor tests for muscular fatigue, reaction time, judgment of space and motion. "Training men to think safely or as I have termed *straight*," Mr. Baylor summarized, "is not accomplished over night. It is a slow but gradual process of building up."

Mr. Gyger described chiefly the mechanical safeguards against accidents. He did not discuss the subject of silicosis, which is of particular interest at this time.

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Cement Mills Hold Trophy Dedications

ALTHOUGH a considerable number of cement mills which won the Portland Cement Association trophy for perfect safety records in 1932 have postponed the customary celebrations in honor of the award, four well-known winners were hosts at trophy parties at their mills since mid-summer.

The plant of the Monarch Cement Co., at Humboldt, Kan., dedicated a new trophy August 30, the Universal Atlas Cement Co.'s mill, Independence, Kan., rededicated its 1931 trophy August 31, the Lone Star Cement Co. mill, Bonner Springs, Kan., celebrated the rededication of its 1927 trophy September 1, and the Olympic Portland Cement Co., Bellingham, Wash., held a rededication of its 1931 trophy on September 5. All of these occasions were well attended.

Citizens of Humboldt and vicinity went to the Monarch cement plant en masse for the unveiling and dedication ceremonies there, the business houses of the town closing for the event. All of the Kansas and Western Missouri mills were represented. The formal program, which took place at 1:30 p. m. in a large decorated area in front of the plant, included music by the local band and a quartette. Speakers were: C. P. Mitchell, superintendent; A. J. R. Curtis, Portland Cement Association, Chicago; W. J. Sinclair, Jr., who accepted the monument for the men of the mill; Hon. J. W. Braucher, mayor of Humboldt, and F. C. Lynch, director of the Kansas City Safety Council. Much praise was also extended to H. F. G. Wulf,

president of the Monarch company, who left his farm in 1908 to pull the enterprise out of financial difficulties and has given his continual attention to company and mill management since that time.

Rededication of the P. C. A. safety trophy of the Universal Atlas company's mill at Independence, attracted a large crowd of company employes and their neighbors. Among special guests of the occasion were E. D. Barry, assistant general operating manager, and Gordon C. Huth, manager of the department of safety and relief, from general headquarters at Chicago. After a picnic lunch in the large park adjoining the plant, the formal ceremonies were held, with C. M. Carman, the superintendent, presiding.

A similar rededication program was conducted on the following day at the Lone Star company's plant at Bonner Springs. The speakers were Congressman U. S. Geyer, J. A. Lehaney, vice-president of the Lone Star Cement Co. of Kansas; F. C. Lynch of Kansas City, and A. J. R. Curtis of the Portland Cement Association. The occasion marked the seventeenth trophy award to subsidiary mills of the International Cement Corporation. After formal ceremonies refreshments were served in the plant park.

The Olympic Portland Cement Co. held the following program by the safety committee:

Invocation.....Rev. James M. Wilson
Address of Welcome.Dr. W. D. Kirkpatrick
Reawarding of Trophy.Mr. Frank J. Barrett
Portland Cement Association
Unveiling of Trophy.....
.....Miss Etu Loring, Miss Joan Ristine
Music—"America."
Acceptance of Trophy....Mr. A. F. Krabbe
General Superintendent
Presentation of Service Pins.....
.....Mr. W. P. Cameron
Sales Manager
Addresses.
Music.
Dance, 9:00 p. m., F. O. E. Hall.

Lime

California lime manufacturers are getting much local publicity, especially in San Francisco newspapers, for their NRA code, which became effective October 13. The publicity is very helpful in establishing a new schedule of prices, effective October 23. A typical article in the *San Francisco Examiner* explains the main features of the code, the price-basing in particular, which states: "Heretofore, San Francisco was designated as the basing point for the establishing of prices over a wide area in California. Henceforth a number of basing points will be named, determined on a basis of what shall be fair and reasonable to all interested parties. This change will definitely affect the marketing operations of a number of companies and is expected to lead to lower lime prices for many communities than were obtainable under the former method of determining prices." The Western Lime Association is established, affiliated with the National Lime Association. R. E. Tremoureux, of the United States Lime Products Co., San Francisco, is president of the Western Lime Association; he is also a director of the National Lime Association.

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Council Grove Lime Products Co., Council Grove, Kan., has taken a 10-year lease on the Helmick quarry and it is reported will build a lime plant. It is proposed to develop a supply of natural gas from adjacent territory. Incorporators of the Lime Products Co., are H. B. Emmons, Joplin; W. C. Kruger, McPherson; C. W. Kruger, Council Grove; W. C. Ritchey and C. J. Skow, Junction City. C. W. Kruger is in charge of developments.

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Southwest Lime Co., Neosho, Mo., of which A. M. Hunt, Neosho, is president and general manager, is reported opening a quarry and building a lime plant. The company has a plant at Seneca, Mo. Riprap and crushed stone will be produced at once; the lime is to come later.

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Canada: Statistics of the lime industry for 1932 have been issued by the Canadian Bureau of Statistics. Production, including both quick and hydrated lime, amounted to 320,650 tons valued at $2,394,537 during 1932 as compared with 344,785 tons worth $2,764,415 in 1931 and 490,802 tons at $4,038,698 in 1930. Producers received an average of $7.14 per ton for quicklime and $9.14 for hydrated lime as compared with $7.38 and $10.71, respectively, in 1931. Prices in 1930 were $7.68 per ton for quicklime and $11.30 for hydrated. The decrease of 7% in volume and 13% in value in the 1932 production from the preceding year resulted largely through a continuation of relatively adverse conditions in general construction and pulp and paper manufacturing. Consumption of lime increased in the gold mining and chemical, fertilizer, tanning and sugar industries. Increases recorded for metallurgical purposes especially reflects recent expansion in the milling of auriferous quartz ores. There are 60 lime plants in Canada representing an investment of nearly $7,300,000.

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Rock Phosphate

Mount Pleasant, Tenn.: The production and marketing of phosphate rock presents a peculiar condition, affected as both are to such varying degrees by compliance and non-compliance with NRA regulations. Local representatives of the large companies, who are the only ones that will have any standing in the final phosphate code if, when and as the code is finally adopted, have of course been unable to do anything regarding NRA, pending instructions from their main offices in New York and elsewhere, so that so far, with the mining season for this year drawing to a close, no NRA support or increased purchasing power of wage earners, has come from them. Some small miners have voluntarily come under NRA, and have increased wages and shortened hours, yet they face complete elimination, when the code is finally adopted. At least partially recognizing this situation, the largest furnace operator supplying the principal lump market for small hand miners, has advanced the price paid by 45c of which 13.4c is made up by removal of emergency charge by the railroads October 1. To miners complying with even the proposed code, this advance will represent only a small part of their increased cost, while to those who have done nothing in that direction, it affords some part of at least decreased loss in their operations. The general business situation here is very adversely affected in that almost complete compliance with NRA has been put into effect, but with chief dependence on agriculture and phosphate mining, in which there has been little or no increase of purchasing power, the trade and local industry factors are finding it hard sledding and practically equivalent to paying each other higher prices to do one another's washing. It is generally felt however that sooner or later the true situation must be brought to the attention of the President, and result in that relief which he alone will be able to give.

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Recent Prices Bid

Sand and Gravel: McConnelsville, Ohio, city purchased gravel from storage pile contaminated by flood water for gravel surfacing streets from Muskingum River Gravel Co. at 40c per cu. yd.

Petersburg, Ill.; county commissioners accepted bid of McGrath Sand and Gravel Co. at $1.10 per cu. yd. for gravel f.o.b. Petersburg.

Milwaukee, Wis.; city purchasing department received six identical bids ranging from $1.25 to $1.48 per ton for sand, gravel and crushed stone. Last spring low bids for the same materials ranged from 77c to $1.39. The state recovery code is in effect.

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Crushed Stone: Prospect, Ohio; township trustees accepted bid of Penry Stone Co. for 420 tons of No. 46 highway stone at $1.10 per ton.

Maquoketa, Ia.; county supervisors let contract for 800 cu. yd. of crushed stone, class B, to J. G. Vernon at $1.30 per cu. yd.

Gallipolis, Ohio; county commissioners let contract for crushed stone for emergency repairs to roads in Greenfield, Walnut and Perry townships to Miller Bros. at 75c per cu. yd., f.o.b. plant.

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Lime: Columbus, Ohio; contract for 3,000 tons of lime for city waterworks let to Scioto Lime and Stone Co. at $6.81 per ton. Previous contract with same company voided because of increased costs under NIRA code.

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Ready-mixed Concrete: Cincinnati, Ohio; city manager awarded contract for 1,860 cu. yd. of ready-mixed concrete to Superior Ready Mixed Concrete Co. at $7.38 a cu. yd.

Rock Products News Briefs

Cement

Pacific Portland Cement Co., San Francisco, Calif., has started court action against the use of Santa Cruz Portland Cement Co.'s "pink" cement in foundations for the Golden Gate Bridge. The "pink" cement is a high silica product, or puzzolana cement, substituted by the bridge engineers after having let the original contract to the Pacific company (see ROCK PRODUCTS, September 25, p. 50). The suit asks for an injunction to: (1) That changes in contracts and all other steps taken to compel use of "pink" cement, manufactured exclusively by the Santa Cruz company, be voided and set aside. (2) That the bridge district be enjoined from paying for any work in which "pink" cement, or any other cement manufactured or sold by the Santa Cruz company, is used. (3) That George T. Cameron and his Santa Cruz Portland Cement Co. be enjoined from receiving any benefit, financially or otherwise, from any work done or materials furnished for the bridge. (4) That district officials and agents be declared personally liable for any money paid to Mr. Cameron or his company, and that the district be compelled to seek recovery of such money, with interest.

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Michigan State Cement Plant, Chelsea, Mich.; the State Administrative Board rejected all bids after a letter was received protesting that the purchasing committee had disregarded an offer of $70,000, when recommending that the plant be sold for $30,000. The board asked for new offers. Auditor General John K. Stack, Jr., chairman of the committee, admitted that D. L. Spickler, Detroit, had bid $70,000 for the plant. He explained that the offer was set aside because it was not accompanied by a certified check for 10% and because Mr. Spickler desired to make payments on a part-time basis. The committee had recommended that the plant be sold for $30,000 cash to Joseph E. Zilk, Ann Arbor, who would use it to make fertilizer.

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Indiana: The *South Bend Tribune* in an editorial headed "State Cement Plant" has this to say: "A few months ago Gov. McNutt was talking about an Indiana state-owned cement manufacturing plant. It was reported that the site had been selected. Lately, however, nothing has been heard of it. Perhaps the governor was talking to frighten the private cement manufacturers who furnish the supply for Indiana highway construction. The governor—and Indiana tax payers, too—ought to study the histories of state-owned cement plants in other states if such a project really is on the Indiana program.

"Here is Michigan, for example, trying to induce somebody to buy its state-owned cement plant. In 12 years the plant has absorbed about $1,000,000 of public money without substantial benefit to the public. Now it is idle, but the tax payers are being assessed for its maintenance. It has been recognized as a white elephant for at least five or six years. In the Green and Brucker administrations nothing was done about it. The present Michigan state administration seems determined to sell it to private interests."

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Alpha Portland Cement Co., Easton, Penn., is reported to be making extensive improvements at its Cementon, N. Y., mill. The raw grinding department is being replaced with an entirely new buliding and new machinery. The kiln room is being remodelled. Two old kilns are being removed and three other kilns are being remodelled and reset. Modern clinker coolers are to be attached to each kiln and a new steam turbine generator is being installed. Landscaping improvements are also being made.

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Honolulu, Hawaiian Islands: Contractors are protesting to Washington against the use of Japanese cement on army construction work, according to the *Chicago* (Ill.) *Tribune*. The army buys this cement because it is sold cheaper than the American product. Contractors here asking for an anti-dumping order similar to the order recently issued against Japanese rubber soled shoes. The contractors assert that the Japanese cement is being sold at a price lower than the cost of production in the United States. Quotations on portland cement made in Japan, after the tariff has been paid, range in Honolulu from $1.85 per bbl. in paper sacks, to $2.15 per bbl., later revised to $2.05. Quotations on portland cement made in the United States range from $2.20 to $2.25, on which, of course, there is no tariff. Army authorities said, regarding the use of Japanese cement for the Fort Ruger work, that, under orders from the Assistant Secretary of War, the contracting officer virtually had to accept the Japanese cement or face court martial charges. The difference between the Japanese and American prices exceeded the "figure of merit" which had been worked out in the War Department at Washington. Orders are that in this event the lowest bid is to be accepted, even if it comes from a foreign country, if the quality of the material is up to standard.

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Marquette Cement Manufacturing Co., Chicago, Ill., won a $250,000 order for cement for Army Engineer river work, by chance, according to Memphis, Tenn., newspapers. The Marquette company and the Kosmos Portland Cement Co., Louisville, Ky., made the same bid for a 120,000 bbl. order. The army engineer in charge directed a stenographer to draw one of two slips of paper from a hat. The Marquette company's name was on the slip drawn. The exact amount of the contract is $244,196.

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Federal Portland Cement Co., Buffalo, N. Y., is being operated under an arrangement with the bondholders' committee, which set a quota of 51,000 bbl. in orders before the mill should open. Albert A. Oesterle, former superintendent of the Peerless Cement Corp. plant at Pt. Huron, Mich., has been engaged as superintendent of the Federal plant. J. Frank Bardon, chemist at the plant here before it closed and since then chemist at the Bessemer Limestone and Cement Co. plant at Youngstown, Ohio, has been re-employed as chemist.

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Aetna Portland Cement Co., Fenton, Mich., employes to the number of 137 with 457 dependents recently sent a petition addressed to President Roosevelt and National Recovery Administrator Johnson asking the speeding up of local public works "since if there was no demand for the cement manufactured these signers would be embarrassed and humiliated by the necessity of depending upon public welfare this coming winter."

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Illinois: Effects of the delay of the state in undertaking highway construction is beginning to be appreciated, but politics is trying to find a way to "hang it" on the cement companies. The LaSalle county board of supervisors have formally complained to the NRA. It is charged that the closing of one mill will put 300 men out of work, and will result in at least 200 additional families being placed on relief for the winter. It is also charged that if the cement officials had not attempted to sell their product to the state at an excessive price—which resulted in an extended controversy that tied up highway construction—the cement company would have had sufficient business to warrant continued operations. However, it is admitted that storage bins of the cement plant are filled, but it is said "that this is the company's own fault."

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Aetna Portland Cement Co., Detroit, Mich., in addition to its regular gray and waterproofed gray portland cements has recently placed on the market a waterproofed mason's mortar cement. This product is the result of several years of research in the company laboratories. In addition to high compressive strength, extraordinary plasticity and workability are features claimed for this new product. O. A. Dibble is general superintendent, Paul Bischoff is chief chemist.

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Statistics of the portland cement industry for September, compiled by the U. S. Bureau of Mines show: Production, a decrease of 31.3% and shipments a decrease of 33.0%, as compared with September, 1932;

portland cement stocks at mills were 18.6% higher than a year ago. The total production for the nine months ending September 30, 1933, amounts to 50,138,000 bbl., compared with 57,860,000 bbl. in the same period of 1932, and the total shipments for the nine months ending September 30, 1933, amount to 49,135,000 bbl. compared with 64,219,000 bbl. in the same period of 1932. In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 164 plants at the close of September, 1933, and of 165 plants at the close of September, 1932.

RATIO (PER CENT) OF PRODUCTION TO CAPACITY

	Sept. 1932	1933	Aug. 1933	July 1933	June 1933
The month	36.9	25.5	35.9	37.6	35.2
The 12 months ended	30.6	25.5	26.5	26.3	26.0

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Sand and Gravel

Hersey Sand and Gravel Co., Hersey, Mich., has entered the concrete paving construction field. The company was recently low bidder on 5.236 miles of 20-ft. concrete paving on US41. The bid was $114,402.

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Cumberland River Sand Co., Nashville, Tenn., taking advantage of slack business in producing and selling sand, is using its floating equipment to deliver 1,158 tons of sheet-steel piling to various Army Engineer projects from Paducah, Ky., to below Nashville on the Cumberland River. The sand company bid $1,400 for the hauling job. Other bids ranged from $2,500 to $4,000.

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North Sand and Gravel Co., Carpentersville, N. J., has been sold by the receivers to the Warren Sand and Stone Co., a new corporation in which the chief interest is held by the Gallo Brothers, Michael and John, operators of a large sand and gravel plant at Netcong. The others in the new company are chiefly former owners of the Carpentersville plant. The officers of the new company are: President, John Gallo, Netcong; vice-president, William A. Stotz, Easton; treasurer, Michael Gallo, Netcong; and secretary, Kenneth F. Kressler, of Easton.

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Arundel Corp., sand and gravel producer, Baltimore, Md., has been awarded two contracts amounting to approximately $1,000,000. One is for the construction of a road in the Great Smoky Mountain National Park and the other for construction of the Intercoastal Waterway in Florida.

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Overlea Sand and Gravel Co., Baltimore, Md., has been ordered by Circuit Court Judge Grason to discontinue the diversion of the stream known as White Harsh run for use in washing gravel. The water thereby has been polluted, it was found, and rendered unfit for drinking by the time it reached the pasture of the Stevens-Baker Co., where from 45 to 60 cattle graze. Judge Grason held that the gravel company had no right to use the water, as its plant was 2,200 ft. from the stream and its property did not abut on the brook's banks. He refused, however, to allow the Stevens-Baker Co. damages asked for inconvenience suffered in the past.

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Basalt Rock Co., Napa, Calif., has taken over the Antioch Sand and Gravel Co.'s plant at Antioch. A. G. Streblow is president of the company, which has plants at Napa and Healdsburg, and a loading platform at Petaluma. The company plans to increase its output from the Antioch plant. Jack Chaplin will continue as superintendent.

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Prairie Sand and Gravel Co., Winona, Minn., has changed hands. C. H. Taylor, Duluth banker, contractor and sand and gravel operator has purchased controlling interest. New officers are Mr. Taylor, president and treasurer, George C. Kissling, Winona, vice-president, and E. J. St. Lawrence of Minneapolis, secretary. These three men and George Campbell of Eveleth and J. J. Sontag of Winona make up the board of directors. Officers of the Prairie company before its recent reorganization were J. H. Seekamp, president, Fred Dalleska, vice-president and Mr. Kissling, secretary and treasurer. The firm is incorporated for $100,000. A garage and machine shop have recently been constructed near the main pit of the company and it is planned to enlarge the plant to handle big contracts and to install a great deal of new machinery. The company owns 213 acres of land running to the bank of Straight slough and if river contracts are obtained the slough will be dredged out and gravel will be hauled on barges from the company pits to the river projects.

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Milwaukee, Wis.: Sand and gravel companies are forming a mortgage company to borrow from the R. F. C. The funds will be loaned to contractors and builders to give an impetus to building and increase the output of the sand and gravel pits. When the finance company is in operation, a contractor who has obtained an order may apply for credit by assigning the order to the finance company. If it finds that his credit rating is good, it will approve a loan. In practice, the finance company will notify the sand and gravel company selected by the contractor to supply him with the necessary sand and gravel. The finance company will pay the sand and gravel company at once and collect at the time that the contractor is paid for his work. The finance company will in fact be an enabling company. It will obtain loans from the Reconstruction Finance Corporation at 3%. It will be a non-profit organization. It will charge the contractor 5%, using the 2% to pay the operating expenses of the company. Sand and gravel companies will assign their assets to the finance company. The assets will become the collateral upon which application will be made to the R. F. C. for loans. The company is being formed upon the advice of Jesse H. Jones, chairman of the R. F. C. The plan is in accordance with the wishes of Gov. Schmedeman and Leo T. Crowley, his adviser, that the smaller industries be given credit assistance.

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California: Board of Supervisors of Orange County declined to adopt an ordinance requiring the licensing of projected sand and gravel operations, requested by the Southern California Rock Products Association and Rock Products Code Association of Southern California (see ROCK PRODUCTS, September 25, p. 33). The ordinance requested by the two associations would require the securing of a license before work is started on a plant and regulation as to location enforced by the board of supervisors. They called attention to a plant that it is planned to open in this county and said that already there are two plants in the county that are selling 20% under the cost of rock produced. Representatives of the associations said they were asking for regulation of future plants to assure that they would not be operated in locations that might offer a flood or other property damage menace to public property. They pointed out that under the proposed ordinance the supervisors could control location of any future plants. The supervisors said they doubted the altruism of the producers. Representatives of the associations indicated that they plan to take the matter before the county planning commission in an attempt to have rock plants included in the contemplated county zoning ordinance.

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Kingston Lake Sand and Gravel Co., Mapleton, Ill., will erect an unloading terminal on the Illinois River at East Peoria. The site with a river frontage of nearly 284 ft. and including a slip that will be used for docking purposes, has been leased for a five-year period. The slip has already been deepened to accommodate barges the company is operating. The company will construct steel bins for storing sand and gravel, set up heating equipment and an office. The terminal will handle material brought up the river from Kingston Lake and will be served by the Toledo, Peoria & Western railroad, and be available to trucks. In the neighborhood of 24,000 tons of sand and gravel were handled on the Illinois river last year by the concern principally for road construction projects. A fleet of 18 barges and two towboats, the "Elsie Marie" and the "Calvin B. Beach," have been operated on the river for some time.

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Portable Sand and Gravel Producers Association of Illinois was organized recently at Rockford. Frank Thompson, Dixon, was elected president, and Thomas Smith, Ottawa, secretary-treasurer. Elmer Larson, Rochelle, presided as chairman.

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Progress With Precast Concrete Joist Floors for Residences

By R. E. Copeland*

A SERIES of articles in CONCRETE PRODUCTS has dealt in considerable detail with the merchandising and manufacture of precast joists. This information has proven of value to prospective joist manufacturers in determining possibilities of the market and manufacturing and equipment requirements. A number of manufacturers already have installed equipment and manufactured joists for preliminary investigations and tests, and also for actual installations. It is believed that a brief summary covering the progress made by such manufacturers and the test program on joist floors underway in the research laboratory of the Portland Cement Association, will be of general interest to the industry.

On January 1, 1933, there was one joist plant in actual production, the Kalamazoo (Mich.) Haydite Tile Co. Today there are 11 plants which have installed manufacturing equipment or have made definite arrangements to do so within the next two or three weeks. The Formigli Corp., which, like the Kalamazoo Haydite Tile Co., is a licensee of the Lith-I-Bar Co., set up for operation last spring and went out after residential floor business. In this it was quite successful and by obtaining a few such jobs, paved the way for the Baltimore armory job on which precast joist floors were bid lower than the alternate type, bar joists. This job will require approximately 45,000 lineal feet of precast joists.

The Ideal Cement Stone Co., Omaha, Neb., has been interested in precast joists for some time. It built some wood molds and cast sufficient joists for a test panel which was loaded to several times the design live load in the presence of the Omaha building engineer and several local residential architects.

Appearance of the construction and its performance under load so favorably impressed the engineer, architects and officials of the company that it was definitely decided to enter into the manufacture and sale of precast joists. As a result of this initiative, joists have been specified and will be used in all three floors of a model home being built by the Omaha Junior Chamber of Commerce. The walls will be of concrete masonry, stuccoed.

The Art Marble Co., St. Louis, Mo., has installed molds and, under the direction of Manager G. C. Turner, manufactured joists and erected a test panel which was loaded to nearly twice the design live load. The deflection at mid-span at maximum load was only about one-half the maximum allowable of 1/360th the span length. The company is quite enthusiastic about the prospects for joists and is promoting joist construction for a number of local projects.

It is common practice in California to build homes without basements. Because of the effect of termites and decay on wood,

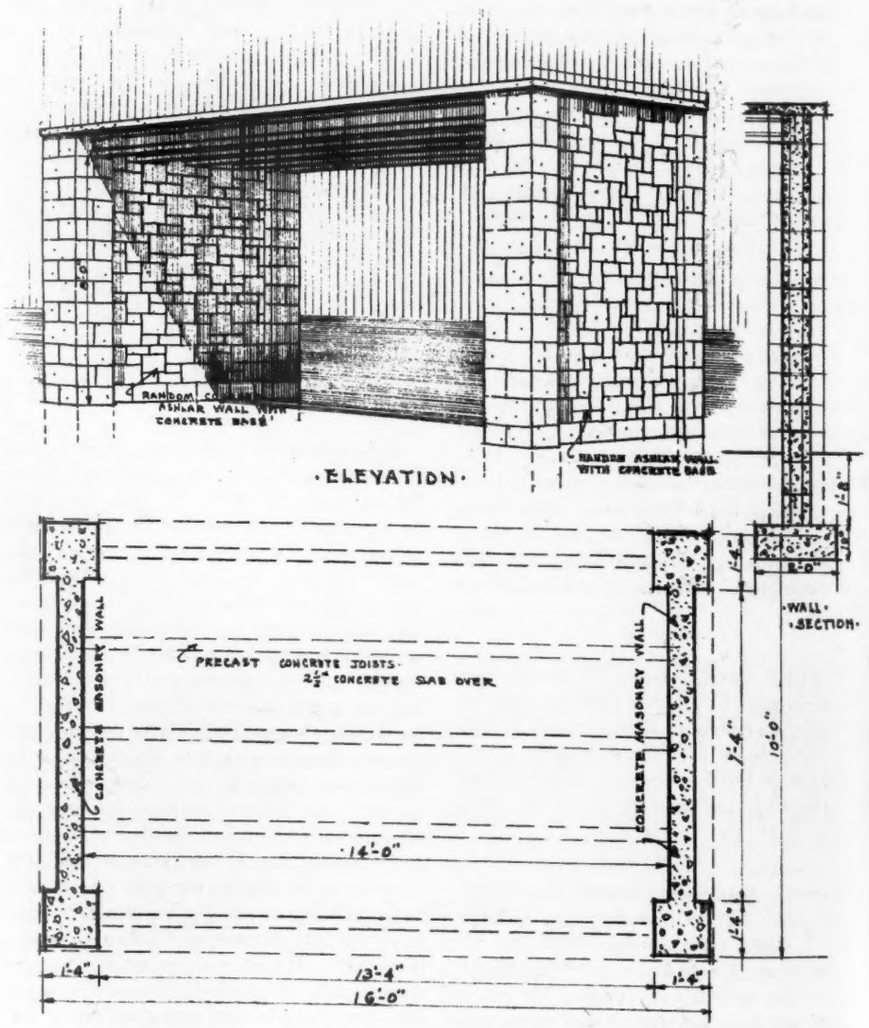


Figure 1.—Suggested exhibit for demonstrating random ashlar, concrete masonry walls, and precast concrete floor joists

*Cement Products Bureau, Portland Cement Association.

more permanent construction such as obtained with concrete is preferred if obtainable at a reasonable cost. To meet this demand, Henry W. Schlueter developed a floor construction based on precast concrete joists and girders supported on a system of precast piers. The Schlueter Foundation Co. was formed and since January 1 has made installations on 12 different jobs. It promises to become a widely used method of floor construction in the Los Angeles area within the near future. Architects and builders are equally enthusiastic about its excellent structural qualities and its economical cost.

The Cinder Block and Material Co., Indianapolis, Ind., has installed a set of steel molds, furnished joists for its first job, and is actively working on new prospects.

There has been considerable publicity regarding the proposed housing projects in Cleveland. Undoubtedly, considerable home building consisting of three and four story apartments in slum clearance operations and individual family dwellings in the outlying districts will be initiated and carried forward with the aid of government funds authorized by the Public Works Administration. Eager to realize their share of business in these projects, W. E. Barney, Hydraulic Press Brick Co., and Fred Herot, Herot Builders Supply Co., Cleveland, are building concrete ashlar panels and have made arrangements to install a set of molds for manufacturing precast joists.

Harve E. Kilmer, manager of the Iowa Concrete Crib and Silo Co., has already supplied precast joists for roof construction of a small fireproof concrete farm home built at the extremely attractive price of $1,300.

Not all the progress has occurred in the Middle West and Pacific Coast. The Erie (Penn.) Patent Block Co., of which T. J. Bell is manager, has secured its first job for precast joists, a new residence to be started soon.

Manufacturers in the south are also on their toes looking for new ways to increase their business.

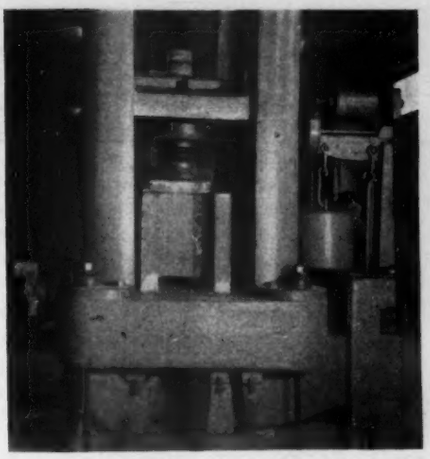


Figure 2—Bond test joist specimen in position for loading

Space does not permit further discussion of the activities of specific plants. Sufficient to say that the concrete products industry has taken hold of the precast joist. Several plants are planning exhibits. (See Fig. 1.)

At the same time that progress is being made in establishing plants and developing the availability of precast joists, the Cement Products Bureau, Portland Cement Association, has been conducting tests to substantiate various theories on the behavior of precast joist floors under load.

The theory of design assumes continuity of action between the joists and cast-in-place concrete slab such as obtained with monolithic construction. The degree of continuity depends upon strength of the bond between the slab and joist. Test specimens consisted of square slab sections cast onto both heads of short lengths of joist in such a manner that a load applied to the projecting end of the joist was transmitted in equal amounts to each joint between the joist and each slab. Fig. 2 shows more plainly the test specimen and method of loading in the testing machine.

Preliminary tests show that bond strength exceeded by from three to four times the theoretical requirements for average residential loading and spans.

Concrete Masonry Code

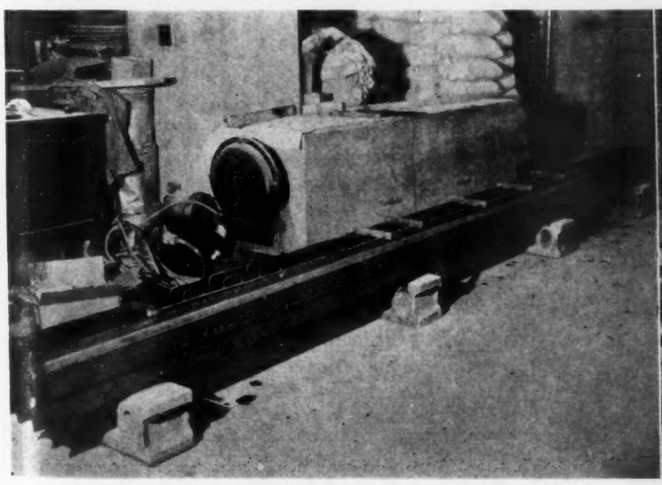
SPONSORS of the proposed code of fair competition for the concrete masonry industry were fortunate in being able to settle virtually all controversial points prior to the public hearing October 5. The National Cinder Concrete Products Association asked for recognition of its branch of the industry as a separate group, but otherwise few changes were suggested in the code as presented.

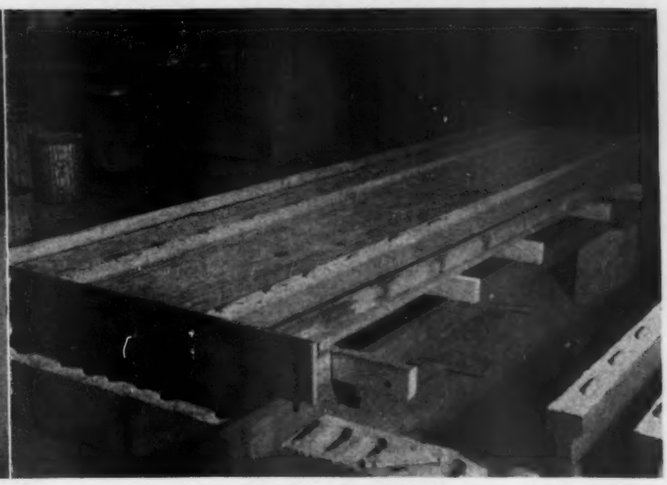
Ralph Fogg, assistant to Deputy Administrator Malcolm Muir, was in charge of the session. He was aided by a corps of advisors including Eugene S. Olsen, Adrian, Mich., as industrial advisor; T. A. Love of the Bricklayers, Masons and Plasterers' International Union, as labor advisor, and H. P. Vaugh, as consumer advisor.

D. R. Collins, former president of the National Concrete Masonry Association, made the official presentation of the code. He stated that the association now represents 73% of 60,000,000 units, the most reliable estimate of 1932 production that can be obtained. More than 5,000 plants, he said, representing a total investment exceeding $100,000,000, are producing concrete masonry units in the United States.

Benjamin Wilk, president of the association, supplemented Mr. Collins' remarks. He explained that an analysis of wages paid during the depression shows that concrete products manufacturers have done their part to maintain employment. Mr. Wilk also explained the necessity for seasonal flexibility in the labor provisions.

The hearing was unique in that no representative of the A. F. L. was present to make exaggerated demands for organized labor. However, two labor groups reserved the privilege of filing briefs. Judging from experience in other codes, the A. F. L. will demand less than a 40-hour week and will not approve the 10-cent wage differential between the North and the South.





Left: ***Figure 3—Steel molds for joist manufacture in research laboratories of P.C.A. Right: Figure 4—Forms in place for casting slab of test panel***

New Machinery and Equipment

Tunnel Equipment

IT IS NOW estimated that at least $220,000,000 will be spent in order to supply the metropolitan water district of Southern California with an adequate supply of water from the Colorado river. Thereby hangs the story—or rather the industrial saga—of one of the West's largest construction projects. The entire length of the proposed aqueduct is about 240 miles. Some idea of the excavating machinery needs on this mammoth piece of work are indicated by the following figures.

The projects call for approximately 85 miles of concrete lined tunnels of 16 ft. diameter, and 75 miles of lined canal, which, with other sub-projects, involve the excavation of more than 37,000,000 cu. yd. of earth.

Full revolving, 1¼-yd. tri-motored electric tunnel shovel, two of which have been purchased by the Metropolitan Water District of Southern California to be used in constructing the Coachella tunnels

For the specially important work of tunnel digging, district engineers in preliminary operations for harnessing the Colorado river, are employing two P and H model M 2 units designed especially for tunnel mucker work. A P and H Model 700 unit is said to be the first excavating machine to move in on the project after the first work started following plans laid 10 years ago by F. E. Weymouth, chief engineer of the U. S. Reclamation Service.

"The Driller"

A NEW PUBLICATION for well drillers has just been published. It is said to be the only business paper serving the well drilling field. The purpose of the magazine is to give well drilling contractors practical and worthwhile information on improved methods of operation. Current developments in the field are cited and an open forum provided for drillers. Issued by the Excavating Engineer Publishing Co., South Milwaukee, Wis., *The Driller* will be published every other month and succeeds the *Armstrong Driller*.

Large Capacity Dragline

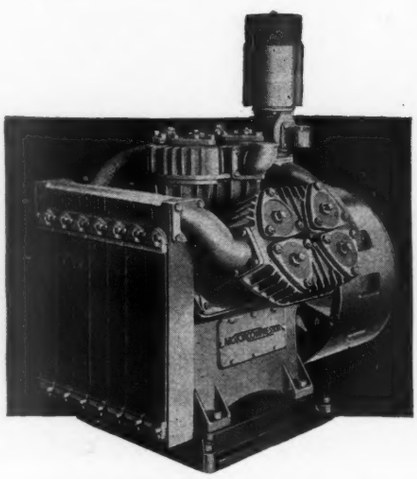
DRAGLINE AND SHOVEL men will be interested in the new unit recently announced by the Northwest Engineering Co., Chicago, Ill., as it represents large capacity combined with the simplicity and mobility not always found with larger units.

It is powered by an 8x9-in. slow speed engine, stated by the company to have torque characteristics to meet the dragdown loads of dragline service. Power takeoff is through helical cut gears enclosed and mounted on ball and roller bearings running in oil. The cushion clutch acts as a guard against overloads. Short tail swing, compactness and feasibility of shipment without major dismantling, as well as elimination of useless weight are named as distinct advantages.

Particular attention has been given to the swinging clutches of the cone type. They are provided with oversized blocks giving smooth, even engagement, uniform pressure and long life, according to the company.

Air Cooling for New Air Compressor

A NEW TYPE of air compressor which is said to require no cooling water and which accordingly is particularly adapted to industrial applications where water is scarce, costly or objectionable, recently has been developed. The machine has a built-in motor and the rotor is carried on a compressor shaft with the motor frame bolted directly to the compressor crankcase.



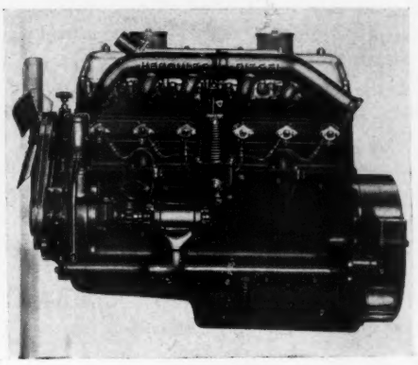
Air-cooled air compressor

The "Motorcompressor" as the Ingersoll-Rand Co., New York, N. Y., has named this unit, is a 2-cylinder, 2-stage machine. The company claims it can well be used for general service or as a standby unit wherever air is required. Units are available in sizes from 20 to 50 hp.

Diesel Units Offered

DEVELOPMENT of a new 6-cylinder, solid injection, high compression full Diesel engine for general industrial purposes has been announced. Special attention has been given to obtaining quietness and smoothness of operation. Revolving parts, say its makers, are dynamically balanced. It is designed to develop 100 hp. at 1000 r.p.m., 177 hp. at 1800 r.p.m. and 188 hp. at 2000 r.p.m.

Fuel consumption is said to be .383 lb. per brake horsepower per hour at 1000 r.p.m.



Compact Diesel unit

The Hercules Motors Corp., Canton, Ohio, introducing this model as the "DX1," calls attention to its underhung crankshaft and through bolt construction. The crankshaft is of large dimension, drop forged from special steel, and is drilled for connecting rod bearing lubrication. In general, the external mounting dimensions have been made interchangeable with the older series of this company's gasoline engines.

Air Cleaners

NEW MODELS of many tractors and industrial power units are being equipped with a recently developed type of air cleaner designed to pass incoming air through a dense fog of oil which is said to wash out all dirt. Distributors are relaying this device to a wide circle of equipment manufacturers. The makers claim that service attention, by use of their device, is re-

duced to the simple monthly operation of removing a reservoir and dumping the dirt. In calling the device to the attention of operators in the rock products field, the Handy Governor Corp., Detroit, Mich., says that it is particularly recommended for power equipment in locations where heavy dust entering through carburetor will otherwise shorten engine life materially.

Light Weight Tractor Unit

WEIGHING approximately 1800 lb. but designed to resist great strain, an entirely new tractor unit is announced by the Austin-Western Road Machinery Co., Chicago, Ill., to all those interested directly or indirectly in construction and building industries.

Tractor mounted blade unit

The blade indicated in the illustration can be raised or lowered to any position and held rigidly or it can be floated. The blade is flexible as to contact angle.

Sand Moisture Recorder

ONLY FROM ONE TO TWO minutes is required to ascertain correctly the moisture content of a wide range of abrasive materials by use of a new device just made available commercially. This is the claim of the Alpha-Lux Co., Inc., New York, N. Y., which offers this apparatus for proper determination of moisture content in molding sand, ganister, coal, coke, etc.

Sand moisture gauge

The scale shown in the accompanying illustration first is adjusted by raising and steadying beam. Material to be tested then is weighed and poured into the container or shaker. Absorbent powder furnished with the tester then is poured into the cap of the container, the cap is replaced and the container shaken horizontally to thoroughly mix the sand or other material with the absorbent.

After a short time the dial on the bottom of the container or shaker is observed for indication of weight percentage of the moisture. Accordingly, the approximate moisture percentage of the material from which the sample has been drawn, can then be determined.

Modern Locomotive

TWO TYPES of drives are provided on the recently introduced 10-ton Diesel powered locomotive brought out by the Fate-Root-Heath Co., Plymouth, Ohio. In sizes from 6 to 60 tons, mechanical gear drives are provided, and Diesel electric drives in sizes from 25 to 60 tons.

Cabs and canopies are made from heavy gauge sheet steel and are fully enclosed. A patented 4-speed transmission is emphasized as an advantage by the manufacturer.

Sizes and frames are made from extra heavy steel. Semi-elliptic springs are both side and cross equalized, tending to provide easy riding over the rough and uneven trackage of industrial areas.

Saving Drilling Time

DESIGNED to handle 3½ and 4-in. drills, a light weight wagon drill now is available that offers interesting possibilities in quarry operation.

Where down holes 20, 30 or 40 ft. in depth are to be drilled, this type of easily portable unit often can be used to advantage. Faster drilling is only one advantage, according to manufacturers of this equipment, the Gardner-Denver Co., which claims: the smaller, more closely spaced holes give better powder distribution than the large, widely spaced well drill holes; that improved powder distribution, gives better fragmentation and will often eliminate block hole drilling and secondary shooting. Powder consumption and lost time, it is claimed, thus are minimized. It is said that the wagon drill will cut deeper in less time than light hand held drills and this particular unit is designed to make 10 ft. steel changes which enables an operator to drill a 20 ft. hole with two pieces of steel instead of ten.

Wagon drill

Only one string of pipe and one piece of hose are necessary from the compressor to the drill.

Electric Tester

A NEW PORTABLE A.C. testing set, known as the Industrial Analyzer, suitable for testing industrial apparatus and motors up to 100 hp., 440 volt, has been announced by the Westinghouse Electric and Manufacturing Co., East Pittsburgh, Penn.

It is capable of making tests up to 125 amperes 500 volts, A.C. Actually this unit is a miniature portable three-phase switchboard panel in a carrying case.

Electric analyzer

Rock Products News Briefs

Construction

Push Highway Construction: Virtually all governors have expressed to Secretary of the Interior Ickes, public works administrator, the conviction that they will have awarded by January 1 all contracts under the $400,000,000 federal allotment for highways. The greater portion of these awards are being completed within 30 days. It was the consensus of the governors that the highway program as a whole is proceeding with reasonable speed after having been somewhat sluggish in the initial stages.

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Diversion of Highway Funds is charged by the National Highway Users Conference against Harry L. Hopkins, National Emergency Relief Administrator. The charge was made in a letter to President Roosevelt, made public by the conference's advisory committee, of which Alfred P. Sloan, Jr., president of General Motors Corp., is president, and was concurred in by officials of the American Petroleum Institute, National Grange, Portland Cement Association, American Automobile Association, Associated General Contractors of America and many other organizations interested directly or indirectly in highways. The letter accused Administrator Hopkins of having encouraged states to use gasoline tax revenues, originally levied for highways, for emergency relief, in order to receive federal funds for the same purpose. As a result of Mr. Hopkins' suggestion, it was asserted, an attempt was made to divert 2 cents of the gasoline tax in Kentucky in order to provide $3,000,000 needed to match a proposed federal contribution of $8,000,000 for relief.

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Industrial Building Gains: Contracts for design and construction of industrial plants show a sharp gain over corresponding 1932 periods, and reflect a general improvement in varied lines throughout the country, according to W. J. Austin, president of Austin Co., engineers and builders. Austin contracts for the third quarter of this year were 280.1% greater in dollar volume than in the third quarter of last year. In the first nine months of 1933, Austin contracts represented a gain of 91.8% over the like period of 1932. Manufacturing lines active in construction work since the first of the year include paint, rubber, paper, oil, stampings, foundry, brass, tractor, chemical, aviation, glass, metal containers, insulation and motion picture. Construction work was carried out in 15 states, largely being confined to manufacturers seeking modern plants for more economical production and distribution.

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Record Highway Building Year in Prospect: Under stimulation of public funds voted in the drive on unemployment, highway construction in the United States will proceed faster than ever before in the coming year, according to letters from state highway officials to Alfred P. Sloan, Jr., president of General Motors Corp. A record highway expenditure of nearly $2,000,000,000 between July 1, 1933, and July 1, 1934, was indicated. The letters from state highway officials, which were sent in response to an inquiry by Mr. Sloan, have been installed in the General Motors building at A Century of Progress International Exposition, Chicago, Ill., as a special Highway Progress exhibit. If the expenditures reach $2,000,000,000 in the fiscal year, as indicated by the statements checked against figures for previous years, the total will compare with a previous record of $1,680,493,095 in the calendar year 1930. The figure dropped to around $1,250,000,000 in 1932, but Congress has appropriated $400,000,000 under the National Industrial Recovery Act and President Roosevelt has expressed a desire that all possible projects be undertaken within a year to stimulate industry and business by increasing purchasing power.

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Asphalt Paving Contractors Organize: Everett Sutcliffe, Boston, Mass., has been elected president of the National Bituminous Pavers' Industrial Association recently organized there as a self-governing association of asphalt pavement producers under the National Recovery Act. Troy Carmichael, Portland, Ore., was elected secretary and treasurer. Offices of the Association will be maintained at 2101 Sixteenth street, N. W., Washington. The new association, declared to represent more than 70% of the product of the industry and hundreds of leading paving firms throughout the United States, has declared its allegiance to the President's recovery program. For purposes of administration the United States and insular possessions have been divided into eleven regional districts in charge of regional administrators.

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Cement Products

Wisconsin Concrete Pipe Association has been incorporated with headquarters in Milwaukee.

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Aquatite Tile Co., Bradenton, Fla., is installing equipment to make crushed stone aggregate for commercial purposes. The company was organized in 1926 by C. I. Needham, who has since been president and general manager. The plant covers an acre of ground and is located on the Seaboard Ry. tracks. Produced at the plant are concrete building tile, drain tile, piers and bases, flood gates, concrete benches, of which about 150 are in use on the streets and in the parks in Bradenton; and the plant also fills special orders in cast stone work. The concern also carries a line of materials for concrete and plaster work, brick, sewer pipe, sand, etc.

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C. A. Duncan, Medford, Okla., has equipped a plant to manufacture concrete pipe for sewerage and highway culverts.

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Spencer Cement Block Works, Spencer, Ia., A. P. Nelson, proprietor, is making a new product—tombstones and grave markers, with granite and terrazzo surfaces. Tombstones of this character are priced at from $75 to $125 while grave markers sell at $15. In addition to manufacturing the stones, the company also makes bronze plates, bearing the individual names and dates and appropriate epitaphs, to be placed on the stones. Mr. Nelson bought the complete rights for the manufacture of these plates. Since Mr. Nelson inaugurated the idea of popular-priced tombstones and markers, his business has increased steadily, more than 150 being sold since this spring when the idea was first put into production. He has agents and salesmen now working in Minneapolis and St. Paul, Chicago, Des Moines, and in many towns and cities throughout the states of Iowa and Minnesota. He is extending his territories steadily and hopes to conduct a nation-wide business within a few months. Over 300 markers and stones have been manufactured and are now on the plant grounds in southeast Spencer together with the thousands of drain tile, concrete blocks, and other items of concrete manufactured by the Spencer Cement Block Works.

◈ ◈ ◈

Diatomaceous Earth

Diatomite Products Co., Portland, Ore., is the name of the reogranized Diatomite Co. Reorganization of the old concern, which has been hampered by top-heavy financial structure for several years, was effected by Robert H. Strong, of Strong & Associates, and P. M. Robinson, of Portland. Under the new plan $488,000 of the outstanding issue of $500,000 in bonds have been converted into stock along with the claims of secured and unsecured creditors. Mr. Strong has been elected president, John S. Campbell of Wilcox-Hayes Co. is vice-president, P. M. Robinson is secretary-treasurer and Hugh G. Mount is general manager. Plans are being made for continuous operation of the deposits.

◈ ◈ ◈

Cement

Kosmos Portland Cement Co., Louisville, Ky., announces "Kosmos Super Cement," a waterproof, quick-hardening portland cement, made by "selective grinding"; all cement particles (to within 5%) are finer than 325-mesh; gypsum treated with tannin is used (the "Super Cement" patent).

THE INDUSTRY

New Incorporations

Council Grove Limestone Products Co., Council Grove, Kan. Authorized capital, 1,000 shares no par.

Brooks Feldspar Co., Alarka, N. C. Capital, $10,000. Incorporators are: Allan A. Brooks and M. C. Close.

Warren Sand and Stone Co., Phillipsburg, N. J., to deal in sand and stone. One thousand shares no par value.

Marion Mica Mills, Inc., Marion, N. C. Capital, $100,000. Tobe Brown and W. K. M. Gilkey, Jr., are the incorporators.

Gulf Coast Shell and Cement Co., Palacios, Tex. Capital stock, $4,000. Incorporators: Manuel Glaros, G. W. Crawford and J. Lacy Pybus.

Flatlands Sand and Gravel Co., 1334 East 40th street, Brooklyn, N. Y. Constantina De Thomasis and Patsy De Acetis are the incorporators.

Texhoma Sand and Gravel Co., Hugo, Okla., capital $10,000. Incorporators are: Oscar Dunagan of Paris, Tex., and W. E. Leonard of Hugo.

Vermiculite, Inc., 38 South Dearborn street, Chicago, Ill. 1,000 shares par value. Austin E. Moshier, A. K. Hornoff and Harry S. Cutmore are the incorporators.

Lancaster Sand and Gravel Co., Inc., Lancaster, N. Y. 1,100 shares no par value. Filed by Lansdowne and Lansdowne, D. S. Morgan building, Buffalo, N. Y.

Starr Gravel Co., Mission Tex. Capital stock, $15,000. To mine, excavate and quarry. The incorporators are Logan Duncan and G. M. and Ruth M. Abney.

Southern States Minerals Co., 38 South Dearborn street, Chicago, Ill. 1,000 shares par value. Norman H. Poole, Harry S. Cutmore and A. K. Hornoff are the incorporators.

Lorain Washed Sand Co., Cleveland, Ohio. Two hundred shares no par value. Seth S. Shunk, Dorr E. Warner, William J. Wilson are the incorporators at 1101 Hippodrome building.

Canton Mineral Products Co., Cherokee county, Georgia, to deal in minerals, ores and clays. Capital stock to be $3,000. J. Hines Wood, B. H. Willis and E. B. Green are the incorporators.

C. W. Tingley Stone Co., Inc., Milwaukee, Wis., to deal in all types of stone and manufacture same in various products. Two hundred shares no par value. C. W., J. A. and D. M. Tingley are the incorporators.

Ready Mixed Concrete Co., Peoria, Ill. 500 shares par value. Incorporators are: Wm. C. and Harry J. Schmoeger and Harry J. Schofield. To buy, sell, deliver and otherwise handle and deal in ready mixed concrete.

Sand and Gravel

Bonner gravel property, north of Ellsworth, Ia., has been opened up.

Wiedner and King have taken a lease on several gravel beds near Ainsworth, Nebr.

Salem Crushed Stone and Sand Corp., Cambridge, N. Y., has filed a petition in bankruptcy.

Sand and Gravel Co., New Martinsville, W. Va., announces the resignation of J. W. Harman as manager.

Stripping operations as a relief project have been undertaken on the gravel pit property north of Timber Lake, S. D.

Buck's Bar Gravel gold mining property near Placerville, Calif., has been leased by Fred Giles for exploitation of its sand and gravel resources as well as gold deposits.

County commissioners in session at Grand Forks, N. D., have allowed gravel property owners near Arvilla $3,000 after a condemnation hearing.

Williamson gravel pit, located near Geddes, S. D., has been decided upon by highway engineers as the source of gravel to be used on pending highway projects.

Panhandle Sand and Gravel Co., Amarillo, Tex., has decreased its capital stock from $300,000 to $150,000.

Lyman-Richey Sand Co., Columbus, Nebr., has increased its force from 7 to 32 men. Production amounts to about 13 cars of gravel a day for road building projects.

Memphis Stone and Gravel Co., operating near Camden, Tenn., reports the death of Dan York, 45, a company engineer, when he was caught in a gravel slide, October 4.

Sunflower Gravel Co., operating on the shoals of the Sunflower River, south of Clarksdale, Miss., is disposing of its output on extensive local road building projects.

Smiley Sand and Gravel Co. has applied to the United States District engineer for permission to dredge sand and gravel from the Ohio River near Dam 39 adjacent to Carrollton, Ky.

Quarries

Lancaster county quarry, Rocca, Nebr., was reopened September 28.

Ralph Rogers Co. is installing rock crushing equipment near Somerset, Ky.

Haxey's quarry, near Brandon, Kan., is furnishing limestone material for local road building.

John Seybold and Son quarry, Forest Junction, Wis., announces reopening of its stone crushing plant.

A new granite quarry has been opened by the W. W. McGee Contracting Co., near McGrath, Minn.

Cox quarry, near New Franklin, Mo., reports increasing activity as a result of local road building projects.

Peterson Construction Co., Minneapolis, Minn., has leased the Martin rock quarries north of La Grange, Mo.

Waldo and Denton have resumed operations at their terrazzo mill, Leslie, Ark., to supply crushed black marble.

Limestone property near Rogers, Ark., will be exploited by city officials who have negotiated for purchase of a rock crusher, etc.

Stripping operations have gone forward on a new quarry near Good Luck, Ky. A new crusher and other machinery have been installed.

Auxvasse rock quarry, near Fulton, Mo.: Bishop Forrest, workman, struck and killed recently by rock dislodged by a blasting operation.

Tobin Quarries, Inc., has leased the stone quarry at Little Rock Landing, north of Ste. Genevieve, Mo. Materials will be disposed of on revetment projects.

Casper Stolle Quarry and Contracting Co. announces through F. W. Stolle, president, removal of its offices from East St. Louis, Ill., to its main quarry plant at Stolle, Ill.

Werth quarry property, near Herculaneum, Mo., is being operated by the local welfare association. A workman was killed by a rock slide shortly after the plant was reopened in September.

Columbia Contract Co., Vancouver, Wash., operating the Fishers rock quarry, announces employment of 50 men upon reopening of the quarry in October. Present orders call for at least 55,000 tons of material for servicing the Columbia river jetty project.

Dubuque Stone Products Co., Eagle Point, Dubuque, Ia., will revamp its crusher equipment, make plant repairs and add new equipment as soon as local dam and revetment projects get under way, according to Herbert E. Manahl, plant superintendent.

Lime

Moore Lime Co., Eagle Rock, Va., has reopened as the Virginia Lime Products Co.

B. H. Yapp and P. H. Shelor have organized to develop the new lime deposit recently located near Buffalo Ridge, Va.

Limestone deposits are being developed increasingly at new quarries near Gardiner, Mont. The product is a porous, cream-colored limestone similar to Italian travertine.

Kelley Island Lime and Transport Co., Marblehead division, reports shipments of stone four times greater to-date this season than during the same period in 1932 basing the report on operations at Port Clinton, Ohio.

Southwest Lime Co. is reopening a quarry property and kiln near Neosho, Mo. A. B. Hunt is president and general manager. A lime burning plant will be built as soon as possible. Lime and rock for railroad riprap will be the principal products.

Dixie Lime Co.'s president, W. M. Palmer, announces that the concern's hydrating plant at Zuber, Fla., which was recently destroyed by fire will be rebuilt at once. Fire occurring October 8 not only destroyed the hydrating plant but damaged kilns. Total damage was between $20,000 and $25,000, partially covered by insurance.

Miscellaneous

American Agricultural Chemical Co., New York, N. Y., is reported planning to develop phosphate deposits near Tampa, Fla.

Deposits of Bentonite near Aberdeen, Miss., may be developed if final chemical analyses recently made by a concern in Memphis, are favorable.

Beryl Welty, superintendent of the United States Gypsum Co. plant, recently reviewed the gypsum industry in an address before business men at Port Clinton, Ohio.

Cement

State cement plant, Rapid City, S. D., has undergone extensive repairs.

Cowell Portland Cement Co. has resumed operations with a force of 200 men at its plant at Cowell, Calif.

Keystone Portland Cement Co. announces removal of its general offices to 1400 South Penn Square, Philadelphia, Penn.

Missouri Portland Cement Co., Cement City, Mo., suspended operations for an indefinite period beginning October 1.

Monarch Cement Co. plant, Humboldt, Kan., shut down temporarily October 1, after operating several weeks at full capacity.

Universal Atlas Cement Co. announces completion of a 1,000-day record at its plant in Duluth, Minn., without a lost-time accident. The period closed October 5.

Alpha Portland Cement Co., upon resuming operations at its plant in La Salle, Ill., October 1, indicated operations for several months of steady running are planned.

Marquette Cement Manufacturing Co. recently acted as host to 300 visiting members of the American Institute of Banking, who were escorted through the company's plant at Oglesby, Ill.

Signal Mountain Portland Cement Co., Chattanooga, Tenn., has been awarded an 80,000-bbl. cement contract by the federal government, for shipment to a point near Greenville, Miss.

Yosemite Portland Cement Co. plant, Merced, Calif., is changing from oil to natural gas as kiln fuel. New gas mains and equipment for adapting the plant to the use of natural gas are being installed.

Lehigh Portland Cement Co. announced October 16 as the date for reopening its plant at Mitchell, Ind., closed since last February. Three hundred men are called for on the regular employment scheduled under the NRA.

Lehigh Portland Cement Co., Metaline Falls, Wash., was forced to close October 10 because of a strike in progress at the Roslyn coal field. If coal again can be obtained, the company, an NRA member, anticipates steady operation for several months.

Federal Portland Cement Co., Buffalo, N. Y., announces orders on hand sufficient to keep its new plant running at least until the end of the year. Albert A. Oesterle, formerly superintendent of the Peerless Cement Co. plant, Port Huron, Mich., has been engaged as superintendent of the Buffalo plant.

Santa Cruz Portland Cement Co., operating its plant at Davenport, Calif., under NRA schedules, reports an increase of $72,000 a year in earnings of residents in that area, effected through the higher pay scale. Sixty additional men have been given employment, and earnings of each average about $100 per month, according to Joseph Riordan, superintendent.

Cement Products

Thomas Products Co., Newark, N. J., has accepted the appointment of A. T. Vanderbilt as receiver.

Iowa Concrete Products Co., Des Moines, Ia., has secured a contract for 19,000 ft. of reinforced concrete pipe to be placed in Franklin County.

Eugene F. Olsen, of the Eugene F. Olsen Co., Adrian, Mich., has been appointed by the National Recovery Administration as industrial adviser on the concrete masonry code.

John Stuart, concrete products manufacturer, of Bremen, Ohio, has made the final draft of the present trade practice code for the National Concrete Burial Vault Association.

Nineteen Milwaukee cement and concrete block manufacturers recently agreed to observe NRA provisions, calling for a 40-hour week and $15 minimum wage in connection with manufacture of their product.

Mineral Products Corp., West Point, Miss., has completed a plant for the manufacture of cement brick and block, etc. R. L. Wade is in charge of the plant. Among equipment units installed are a rock crusher and dryer.

E. C. Burlingame and John Burlingame under the firm name of Burlingame Brothers have purchased the Wetzel Builders Supply Co., Wheeling, W. Va. The company will manufacture cement block and handle a full line of building supplies.

Floyd L. Martin, secretary of the Everett Concrete Products Co., Everett, Wash., presided over a recent meeting in Olympia when plans for a regional code to supplement the national concrete pipe manufacturers' code of fair trade practices was considered.

Obituaries

Nedian H. Wright, 52, owner of the Wright Cast Stone Co., Jackson, Miss., died September 19.

Charles Piez, board chairman of the Link-Belt Co., Chicago, died October 2 in Washington, D. C.

Charles J. Cameron, president of Concrete Products, Ltd., died September 28 in Regina, Sask., Canada.

Patrick H. Sweeney, secretary and treasurer of the Wolverine Portland Cement Co., Coldwater, Mich., died October 15.

John W. Jenkins, 78, proprietor of John W. Jenkins and Son, lime manufacturers, died September 17 at his home in Durbin, Ohio.

Louis Skrainka, 73, president of the Big Bend Quarry and Construction, Maplewood, Mo., and of the Union Quarry Co., died September 9.

Clement E. Brooks, 43, assistant credit manager of the Lehigh Portland Cement Co., died September 24 on a golf course near his home in La Grange Park, Ill.

Harry Van Arsdale, 67, formerly of Racine, Wis., where he conducted a concrete pipe manufacturing business, died October 2 at his residence in Pasadena, Calif.

Peter B. Bradley, founder and at the time of recent death, treasurer of the Bradley Pulverizer Co., Allentown, Penn., is survived by his widow and one son, William L. Bradley, now president of the concern.

French Rayburn Bissell, board chairman of the International Cement Corp., died at his home in New York City, September 25. He was 72. Born in St. Louis, Mo., he was president of the St. Louis Portland Cement Co. from 1904 to 1907, later president of the Texas Portland Cement Co.

John W. Kaufman, 67, chairman of the board of directors of the Marble Cliff Quarries Co., died at Celina, Ohio, October 1. Mr. Kaufman entered the quarry business 27 years ago, becoming associated with the Woodruff and Pausch Co. Later he merged this concern with the Casparis Stone Co. to form the Marble Cliff Quarries Co.

Manufacturers

Universal Vibrating Screen Co., Racine, Wis., reports increasing repeat orders on its type "C" screen and also on type "M."

American Manganese Steel Co., Chicago Heights, Ill., announces W. K. Leach, formerly with General Alloys Co., as general manager of its alloy division.

Superheater Co., New York, N. Y., has acquired an interest in and assumed management of the Air Preheater Corp., Wellsville, N. Y. The new president of the latter concern is F. A. Schaff.

Kron Co., Bridgeport, Conn., announces Roy E. Sampson, Evansville, Ind.; B. F. Crawford Co., Terre Haute, Ind.; and Mechanical Equipment Corp., New Orleans, La., as distributors for its complete line of industrial scales.

Falk Corp., Milwaukee, Wis., manufacturers of transmission machinery, announces that T. F. Scannell, St. Louis representative for several years, is its new representative in Dallas, Tex. The company's St. Louis office has been taken over by Fitch S. Bosworth.

Pangborn Corp., Hagerstown, Md., has appointed Ralph M. Trent as sales engineer in Pittsburgh territory. Fred E. Wolf has been appointed as sales engineer of the New England district with headquarters in Arlington, Boston, Mass.

Black and Decker Manufacturing Co., Baltimore, Md., manufacturers of portable electric tools, reports a steady monthly increase in volume and earnings since April. Plant employment has increased 127% since spring and the company is now operating on NRA schedules.

General Electric Co., Schenectady, N. Y., announces adaptation of its electric water heater to industrial use. Model W-45 is particularly designed for larger production requirements and its storage principle will permit night storage operation, thereby frequently earning the minimum rate for electric energy charged to users.

Louis Allis Co., Milwaukee, Wis., has appointed E. F. "Gene" LeNoir as its representative in Allentown, Penn.; Wallace I. Cousins has been named representative for Delaware with headquarters in Baltimore. Charles F. Norton, formerly vice-president and general manager of the Howell Electric Motors Co., now is associated with the Louis Allis Co.

Trade Literature

Rope. Installation stories and some technical data on various combination and preformed wire rope. BRODERICK AND BASCOM ROPE CO., St. Louis, Mo.

Drills. Six-page folder gives full specifications and suggestions on application of wagon drills. Operating economy cited. GARDNER-DENVER CO., Quincy, Ill.

Rope Socket. Eight-page illustrated bulletin describes a new type of wedge socket designed to protect wire rope against abuse. JOHN A. ROEBLING'S SONS CO., Trenton, N. J.

Motors. Technical and non-technical news, questions and answers from operators of motorized equipment published as Vol. I, No. 12, of "The Motorizer." LINCOLN ELECTRIC CO., Cleveland, Ohio.

Trailers and Buckets. Described as applied to hard digging operations. General presentation of the company's line in 4-page letter folder. WELLMAN ENGINEERING CO., Cleveland, Ohio.

Flexible Couplings. Standard file size bulletin with numerous illustrations, diagrams, tables of ratings, dimensions, weights and list prices of "Gearflex" couplings. FARREL-BIRMINGHAM CO., INC., Buffalo, N. Y.

Electric Grinders. Portable units designed especially for angle work and miscellaneous shop uses, illustrated and described as to sizes, adjustments, etc., in folder. CHICAGO WHEEL AND MANUFACTURING CO., Chicago, Ill.

Power Shovels. Graphic presentation in semi-technical language of multiple applications of the P and H power shovels on building and highway projects. Presented in the usual informal but informative style of the house publication "P & H Crowd." THE HARNISCHFEGER CORP., Milwaukee, Wis.

Conveyors. Substantial catalog illustrates and describes stationary and portable equipment for conveying dry pulverized material. Application to specific problems of conveying and distribution in grinding plants and process plants separately described and illustrated. Additional pages deal with stationary and portable pumps for unloading operations with particular emphasis on portland cement discharge on construction projects. FULLER COMPANY, Catasauqua, Penn.

Agitators. Self-contained agitator with inbuilt motor and speed reducer designed for compactness and strength described in detail as to specifications and performance in a 4-page folder. Brief supplementary data also given on stirrers. PATTERSON FOUNDRY AND MACHINE CO., East Liverpool, Ohio.

Air Compressors. Vertical duplex compressor units as applied on various mountings including trailer and "towabout," also hard wood skid and regulation motor clutch mountings, fully described in an 8-page folder. Illustrations of pavement breakers, rock hammers, clay diggers, etc., also included. WORTHINGTON PUMP AND MACHINERY CORP., Harrison, N. J.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912,

Of Rock Products, published every month at Chicago, Illinois, for October 1, 1933.

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Nathan C. Rockwood, who, having been duly sworn according to law, deposes and says that he is the editor of Rock Products and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Tradepress Publishing Corporation, 330 So. Wells St., Chicago, Ill.

Editor—Nathan C. Rockwood, 330 So. Wells St., Chicago, Ill.

Managing Editor—None.

Business Manager—L. A. Koch, 330 So. Wells St., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (This information is required from daily publications only.)

NATHAN C. ROCKWOOD,
Editor.

Sworn to and subscribed before me this 29th day of September, 1933.

(Seal) FRANK A. KUNTZ,
Notary Public.

(My commission expires Sept. 15, 1936.)

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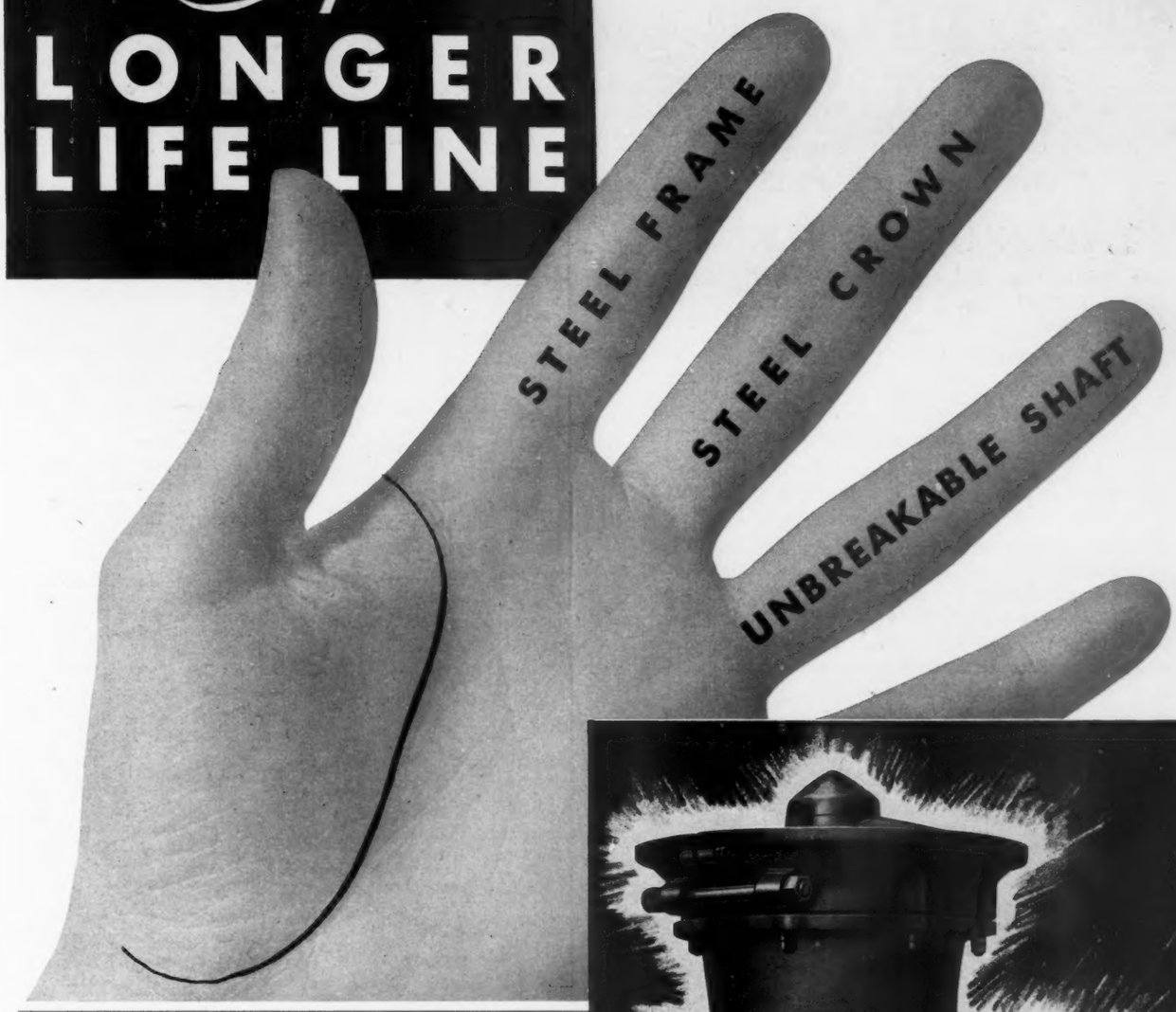

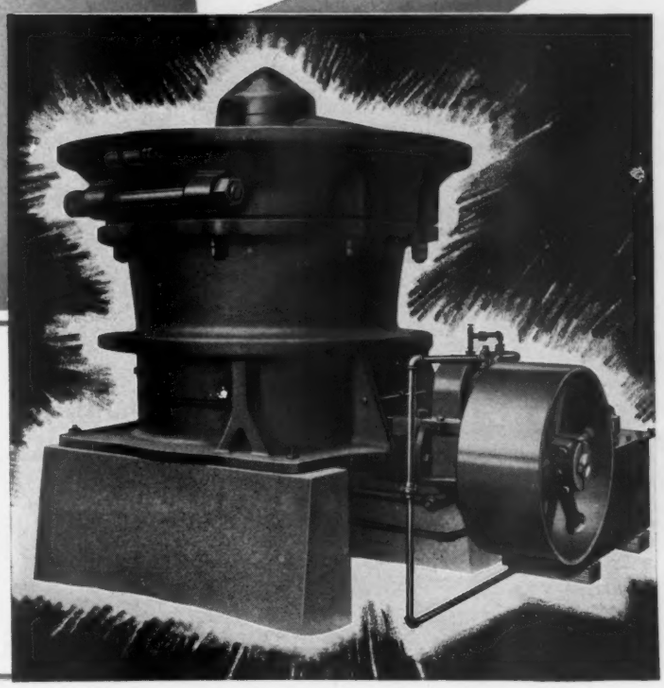

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November 25, 1933

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